Laugh When Disaster Strikes

Backup Methods & Procedures

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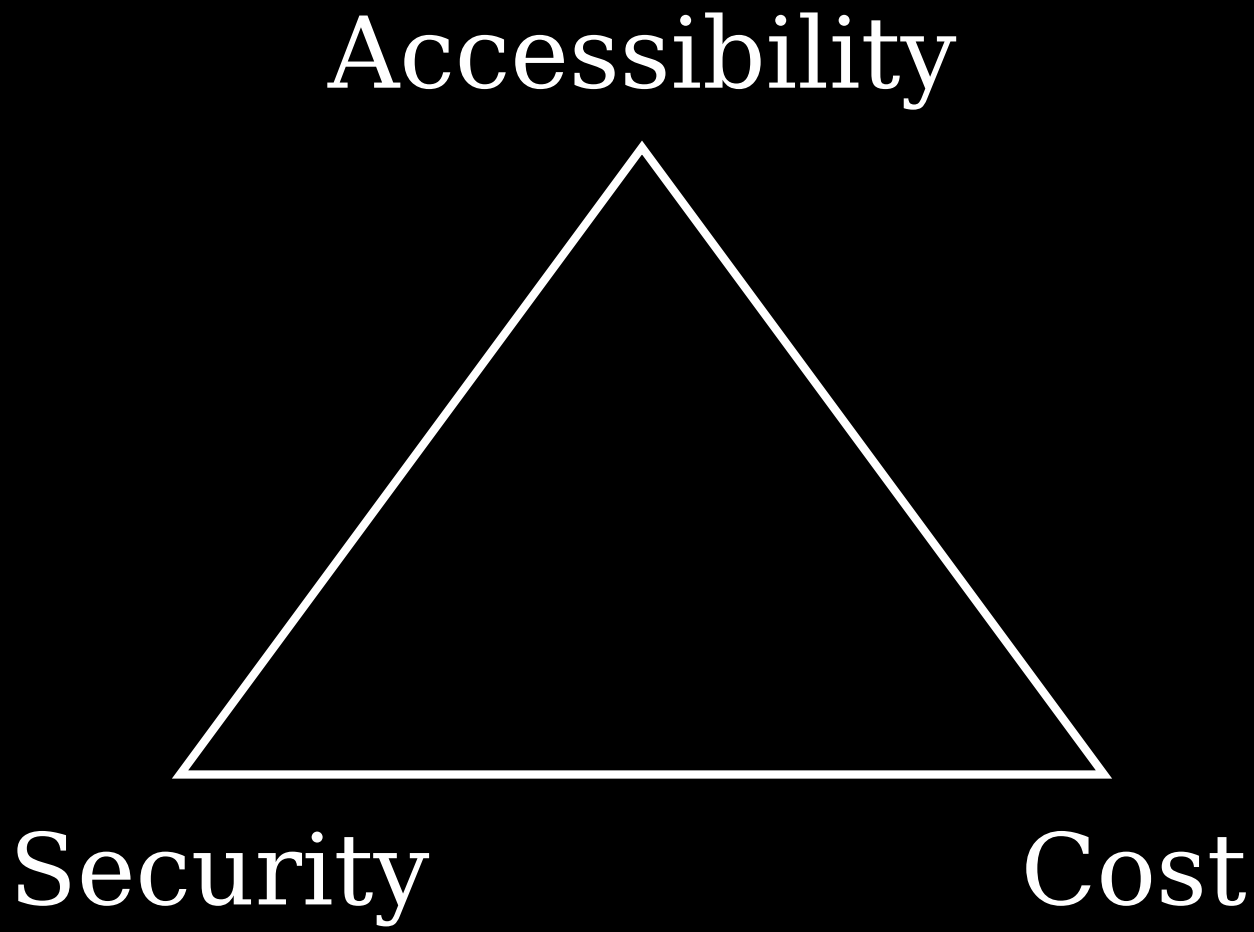
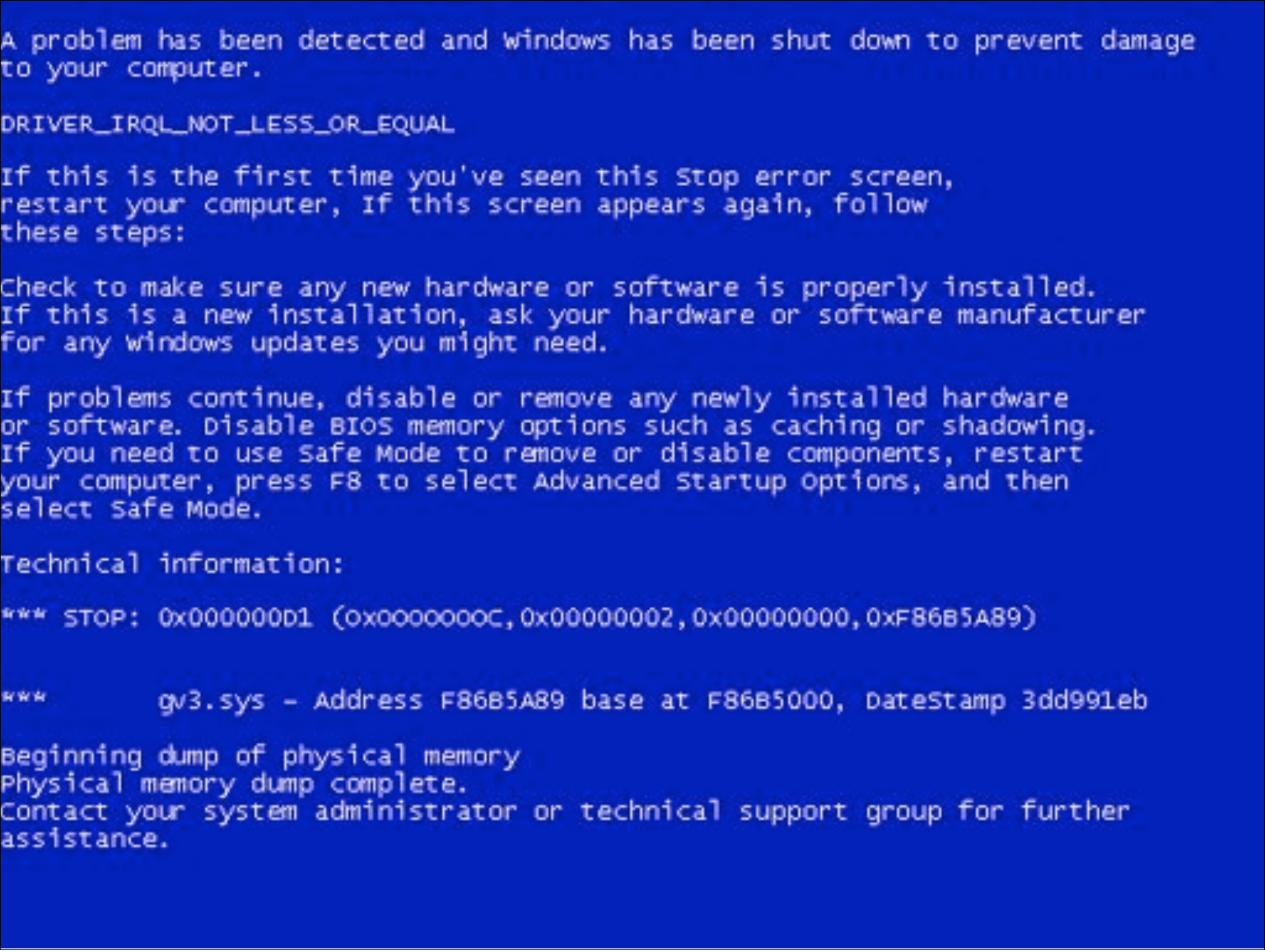

Accessibility
Security
Cost

Why?

How much data
can you afford to lose?

1 hour?
1 day?
1 week?


A problem has been detected and windows has been shut down to prevent damage
to your computer.
DRIVER_IRQL_NOT_LESS_OR_EQUAL
If this is the first time you've seen this Stop error screen,
restart your computer, If this screen appears again, follow
these steps:
Check to make sure any new hardware or software is properly installed.
If this is a new installation, ask your hardware or software manufacturer
for any windows updates you might need.
If problems continue, disable or remove any newly installed hardware
or software. Disable BIOS memory options such as caching or shadowing.
If you need to use Safe Mode to remove or disable components, restart
your computer, press F8 to select Advanced Startup Options, and then
select Safe Mode.
Technical information:
*** STOP: 0x000000D1 (0x0000000C,0x00000002,0x00000000,0xF86B5A89)
*** gv3.sys - Address F86B5A89 base at F86B5000, DateStamp 3dd991eb
Beginning dump of physical memory
Physical memory dump complete.
Contact your system administrator or technical support group for further
assistance.

Backing Up Data: Online

Amazon S3

Simple Storage Service

Files can be public or private

Automatic torrents:
append `?torrent` to file's URL

Amazon provides the service,
not the software

Storage

Starts at $0.125/GB 1st TB/month

Data Transfer

✓ $0/GB in

✓ Starts at $0/GB 1st GB/month out

✓ $0.12/GB up to 10 TB/month out

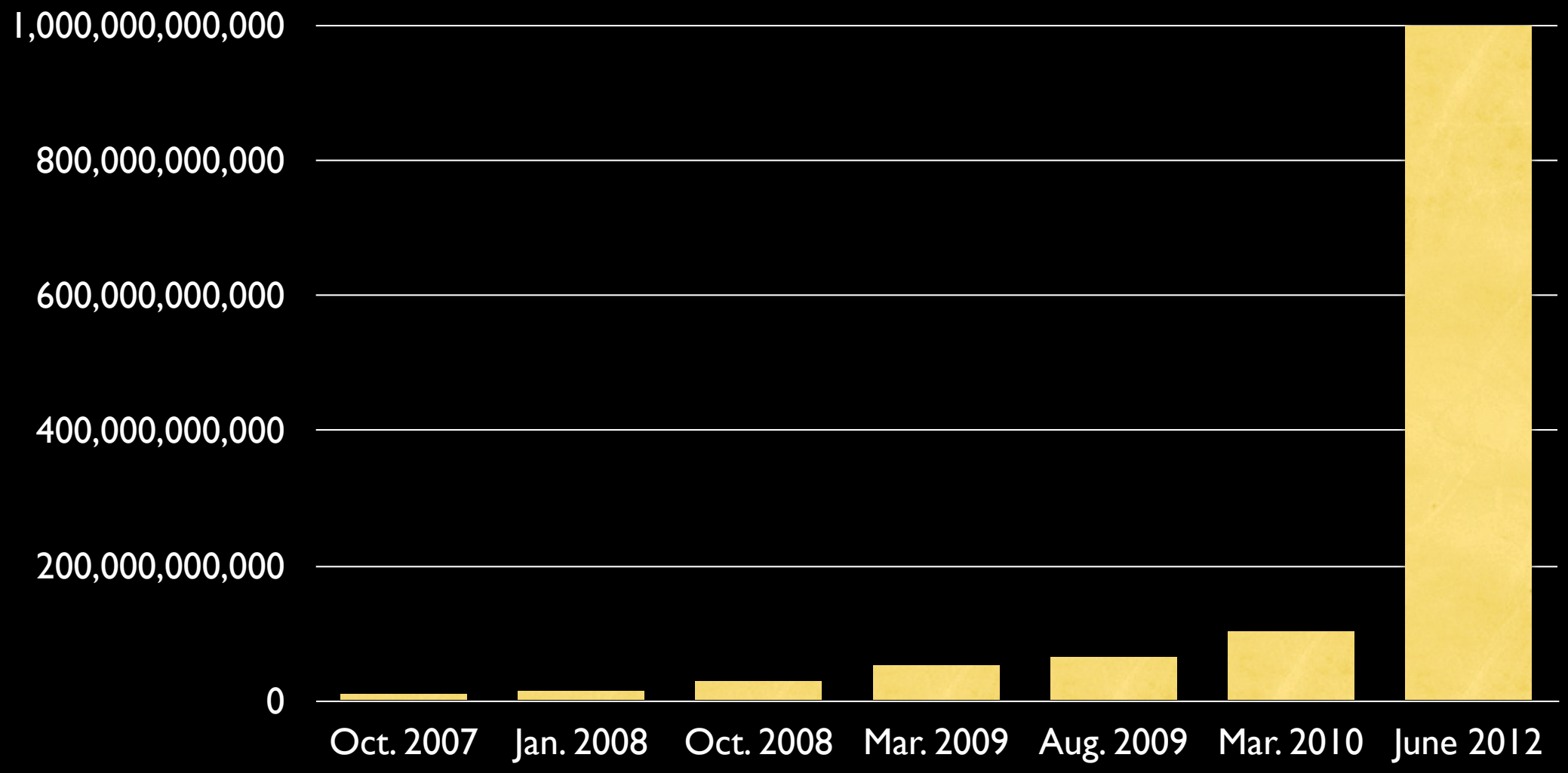
Requests

✓ $0.01/1000 PUT, COPY, POST, LIST

✓ $0.01/10,000 GET

✓ $0.00 DELETE

Number of Objects Stored at S3



Dropbox

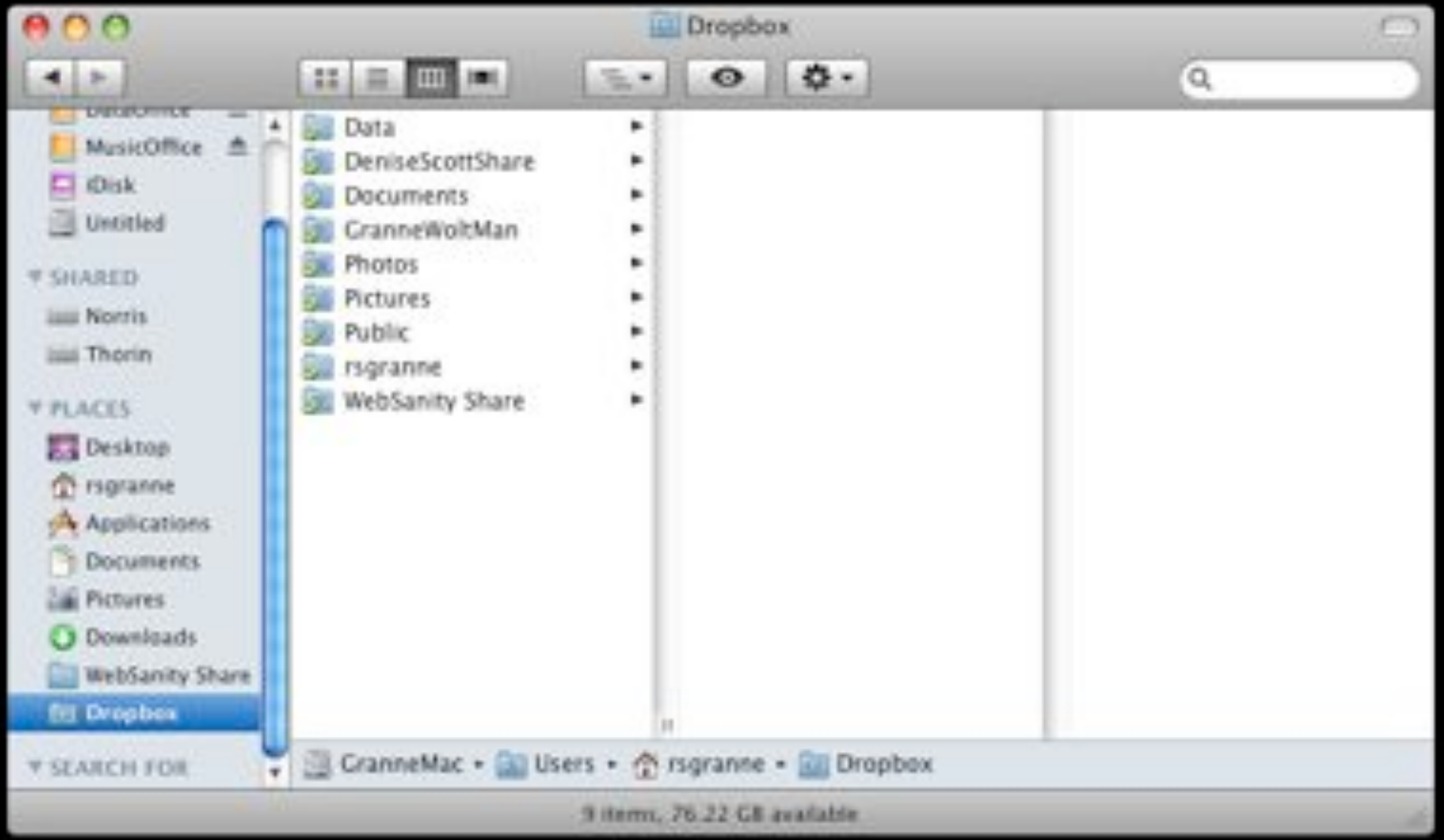
The following video is old,
but still shows the main features
of Dropbox

Dropbox is no longer in beta

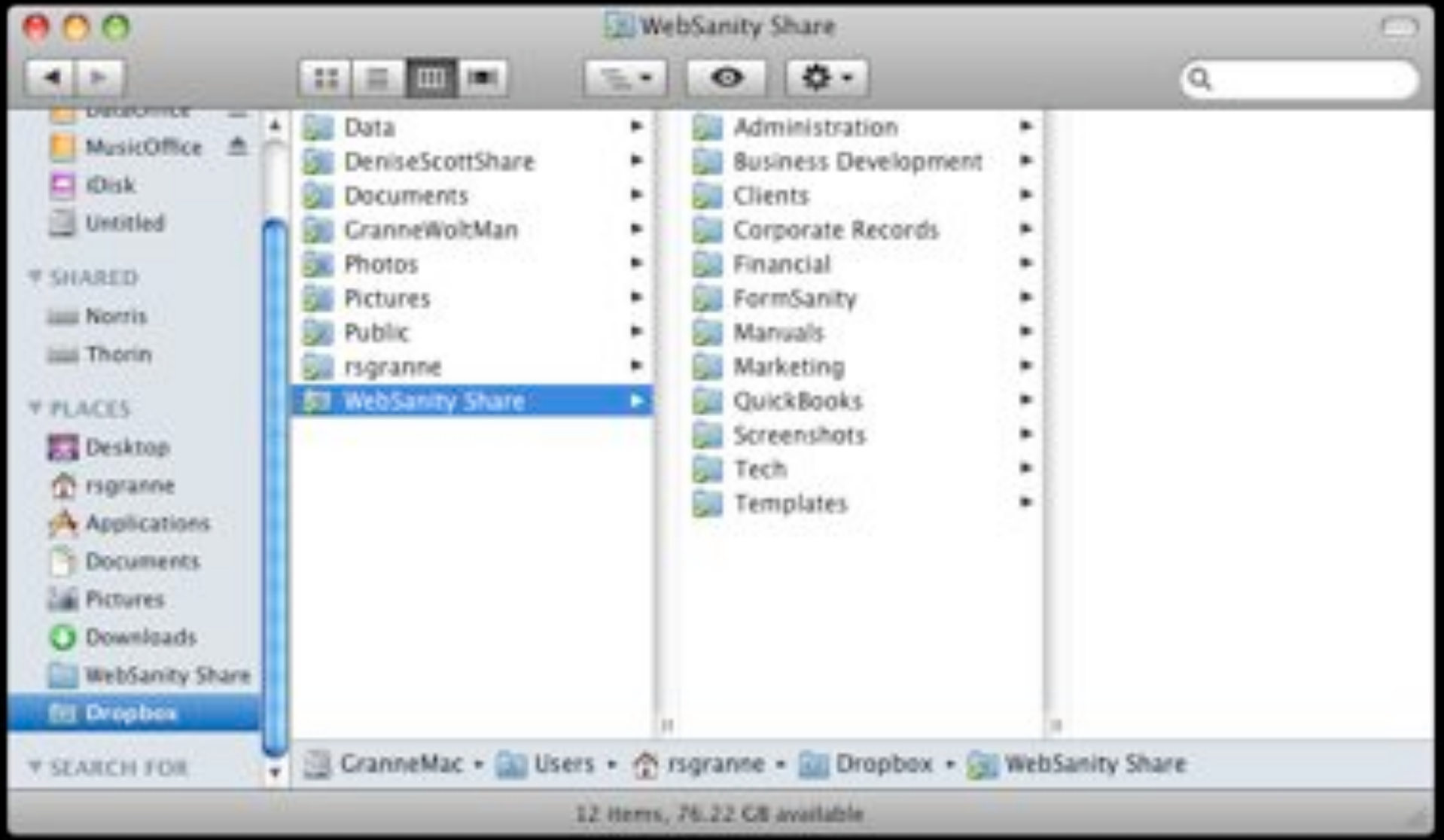
The URL is now www.dropbox.com

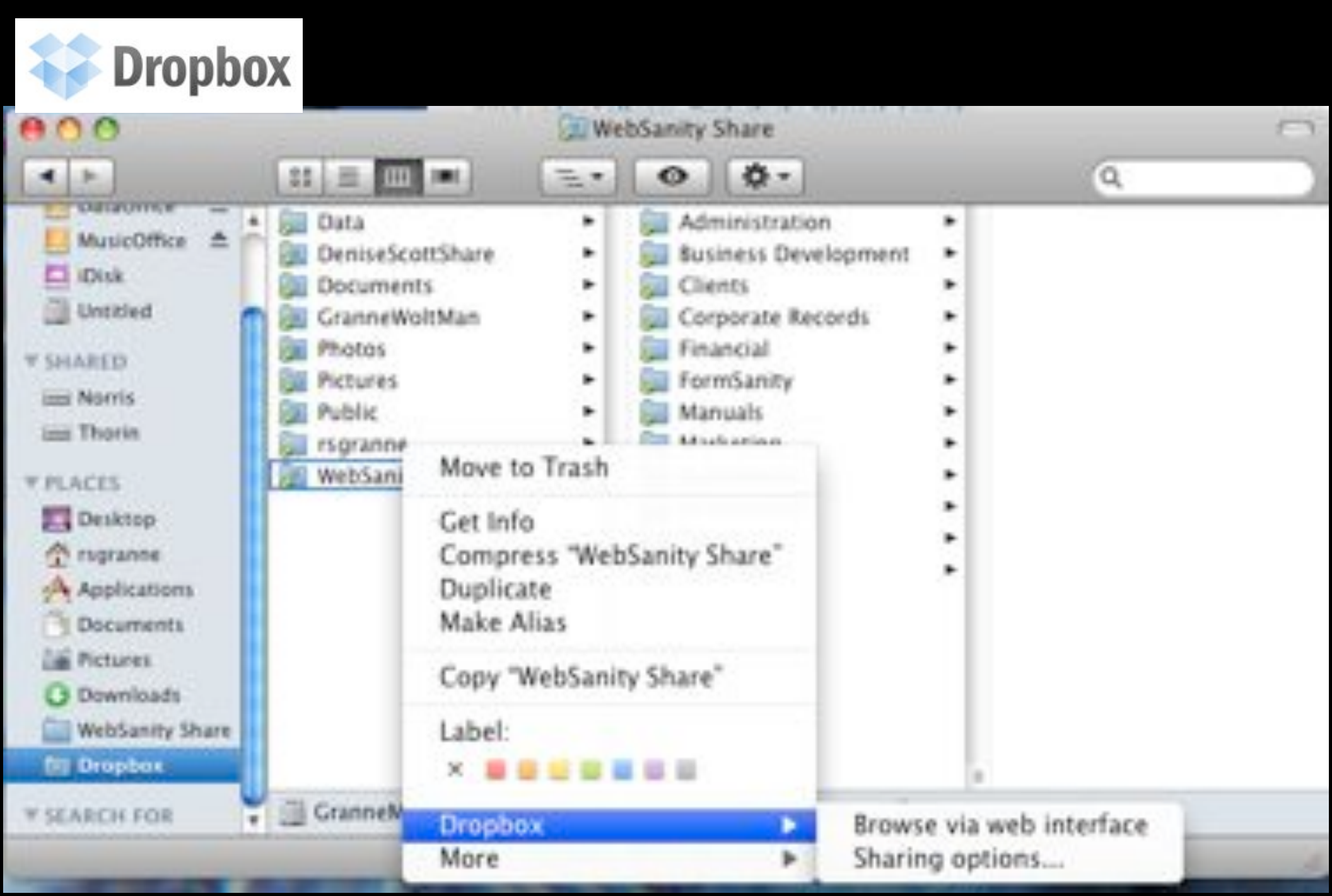
Drew Houston
beta@getdropbox.com

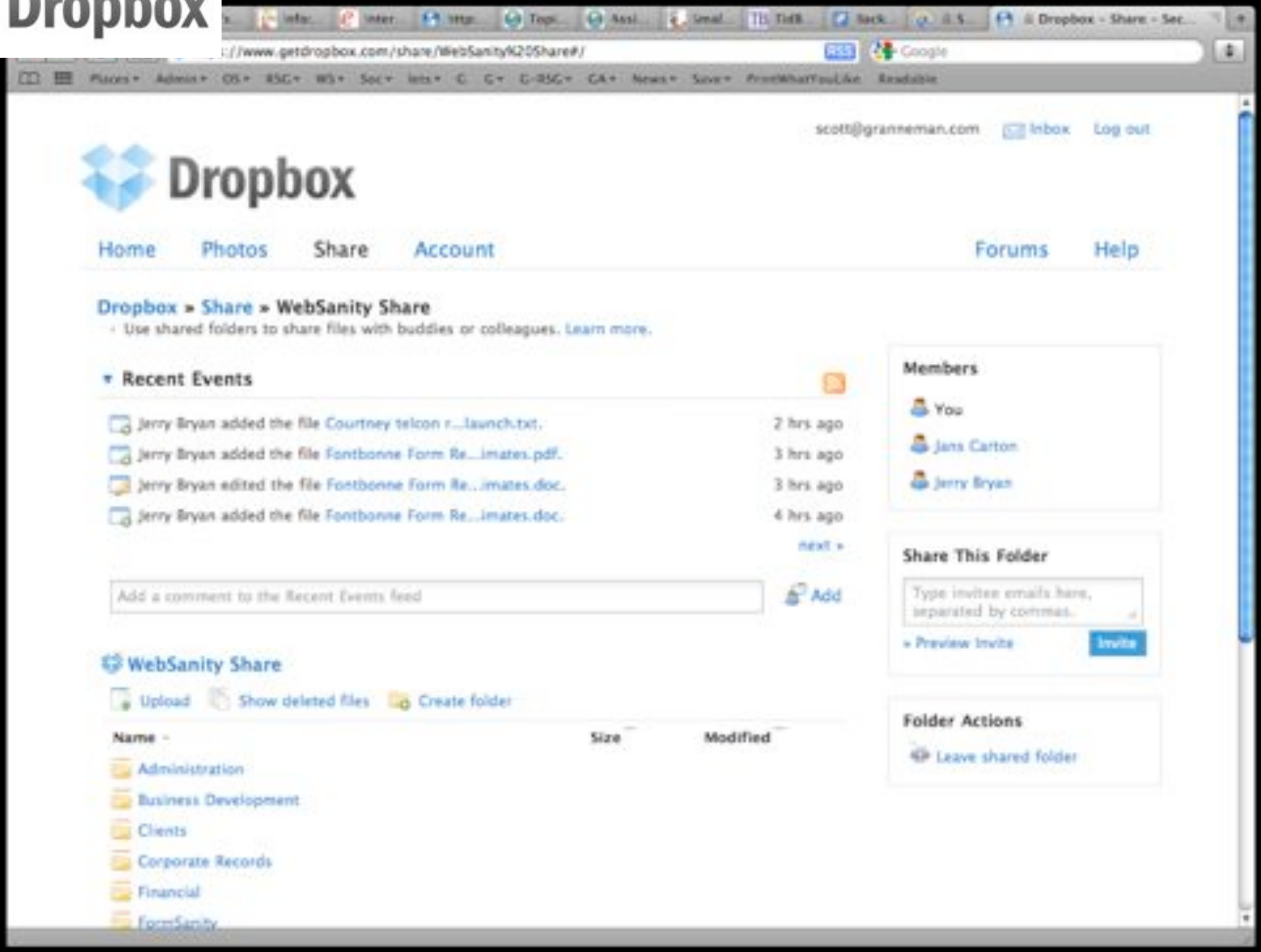
Dropbox

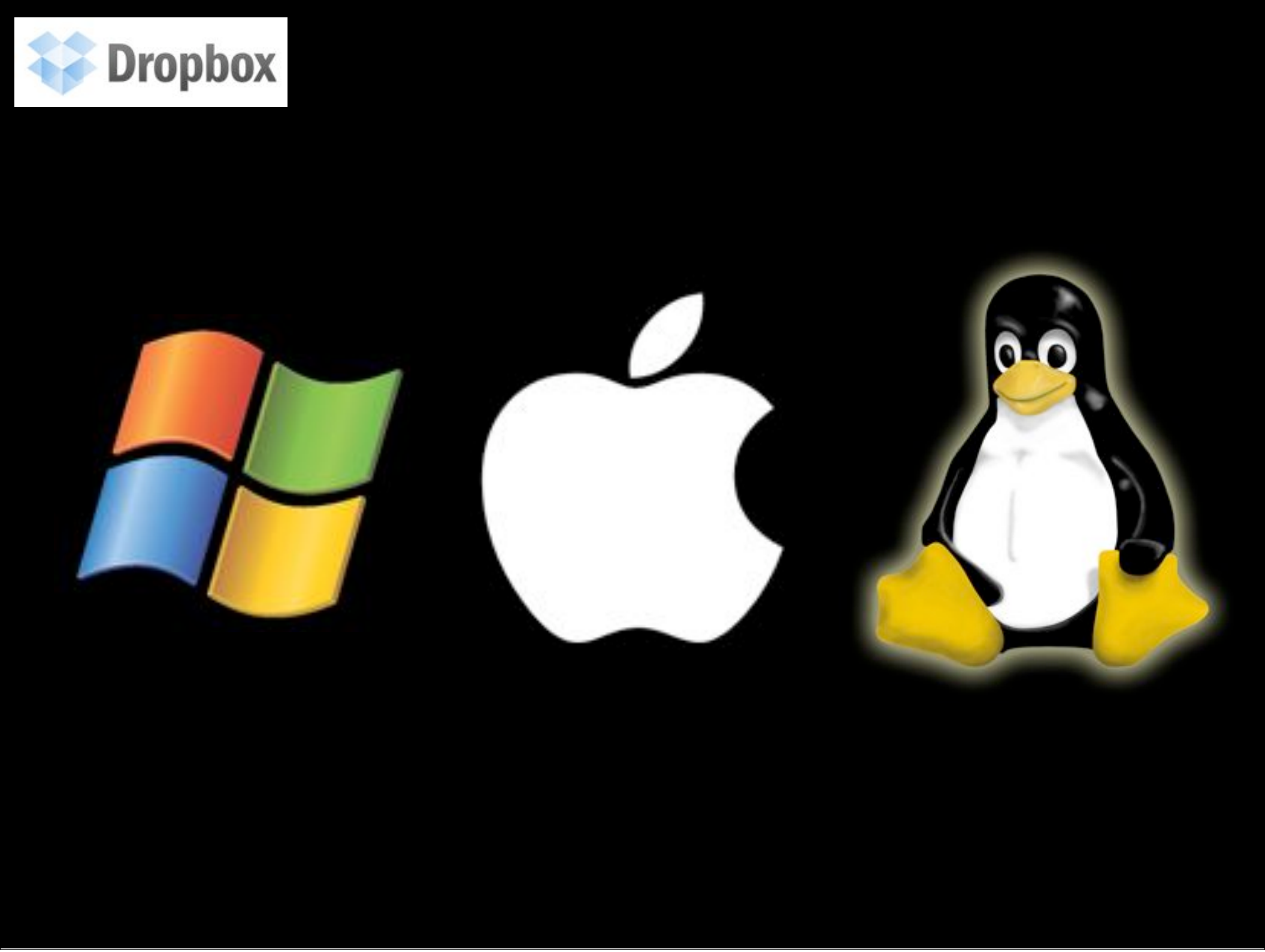

Dropbox
MusicOffice
iDisk
Untitled
SHARED
Norris
Thorin
PLACES
Desktop
rsgranne
Applications
Documents
Pictures
Downloads
WebSanity Share
Dropbox
SEARCH FOR
Data
DeniseScottShare
Documents
GranneWoltMan
Photos
Pictures
Public
rsgranne
WebSanity Share
GranneMac
Users
rsgranne
Dropbox
9 items, 76.22 GB available

Dropbox


WebSanity Share
MusicOffice
iDisk
Untitled
SHARED
Norris
Thorin
PLACES
Desktop
rsgranne
Applications
Documents
Pictures
Downloads
WebSanity Share
Dropbox
SEARCH FOR
Data
DeniseScottShare
Documents
GranneWoltMan
Photos
Pictures
Public
rsgranne
WebSanity Share
Administration
Business Development
Clients
Corporate Records
Financial
FormSanity
Manuals
Marketing
QuickBooks
Screenshots
Tech
Templates
GranneMac ▸ Users ▸ rsgranne ▸ Dropbox ▸ WebSanity Share
12 items, 76.22 GB available


Dropbox
WebSanity Share
MusicOffice
iDisk
Untitled
SHARED
Norris
Thorin
PLACES
Desktop
rsgranne
Applications
Documents
Pictures
Downloads
WebSanity Share
Dropbox
SEARCH FOR
Data
DeniseScottShare
Documents
GranneWoltMan
Photos
Pictures
Public
rsgranne
WebSani
Administration
Business Development
Clients
Corporate Records
Financial
FormSanity
Manuals
Move to Trash
Get Info
Compress "WebSanity Share"
Duplicate
Make Alias
Copy "WebSanity Share"
Label:
Dropbox
More
Browse via web interface
Sharing options...


Dropbox
scott@granneman.com
Inbox
Log out
Dropbox
Home
Photos
Share
Account
Forums
Help
Dropbox » Share » WebSanity Share
Use shared folders to share files with buddies or colleagues. Learn more.
Recent Events
Jerry Bryan added the file Courtney telcon r...launch.txt. 2 hrs ago
Jerry Bryan added the file Fontbonne Form Re...imates.pdf. 3 hrs ago
Jerry Bryan edited the file Fontbonne Form Re...imates.doc. 3 hrs ago
Jerry Bryan added the file Fontbonne Form Re...imates.doc. 4 hrs ago
next »
Add a comment to the Recent Events feed
Add
WebSanity Share
Upload
Show deleted files
Create folder
Name
Size
Modified
Administration
Business Development
Clients
Corporate Records
Financial
FormSanity
Members
You
Jans Carton
Jerry Bryan
Share This Folder
Type invitee emails here, separated by commas.
» Preview Invite
Invite
Folder Actions
Leave shared folder


Dropbox

128-bit SSL encryption during transport

Data encryption using 256-bit AES

New & changed files automatically uploaded

30 day archive

2 GB = free

~~50~~ 100 GB = $100/year

~~100~~ 200 GB = $200/year

http://www.dropbox.com

Good for backup

Great for collaboration
& syncing

If you decide to sign up,
please use this link

http://db.tt/P4fnana

I get 500 MB of free space!

(& you get an extra 250 MB!)

Backblaze

BACKBLAZE

Backblaze Backup
Settings
Schedule
Exclusions
Security
Reports
Logs
Online Name for this computer:
Simon
Throttle:
Faster Network
Faster Backups
Warn me when not backed up for:
7 days
Show Backblaze icon in the menu bar:
Select Hard Drives to Backup
Macintosh HD
Paula
Time Machine
Randy
Unplugged
VM Drive
Cancel
OK

BACKBLAZE

backblaze backup
Show All
Initial Backup in Progress
Pause Backup
Restore Options
Settings

128-bit SSL encryption during transport

Data encryption with AES

New & changed files automatically uploaded

Will not back up applications, ISOs, or Time Machine drives

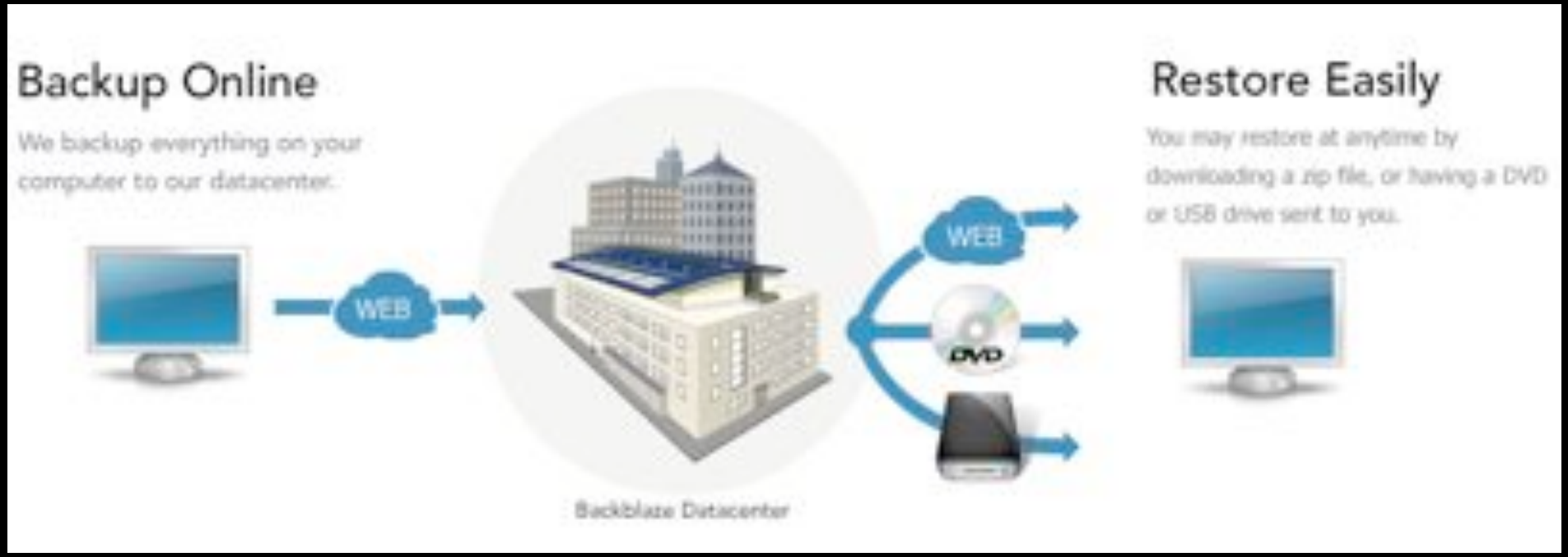
30 day archive

On Macs,
correctly backs up & restores
file resource forks, types,
creator, creation date,
& modification date

BACKBLAZE

Data recovery

✓ Online download
✓ Order data on DVD ($99)
✓ Order data on external hard drive ($189 for 500 GB)



BACKBLAZE

2 GB = free

Unlimited = $50/year

http://www.backblaze.com

CrashPlan

CRASHPLAN
Automatic Online Backup

Home and Home Office

- **NEW!** Unlimited online backup
- Automatic, Secure, Friendly
- Back up to Friends and Family
- FREE for personal use

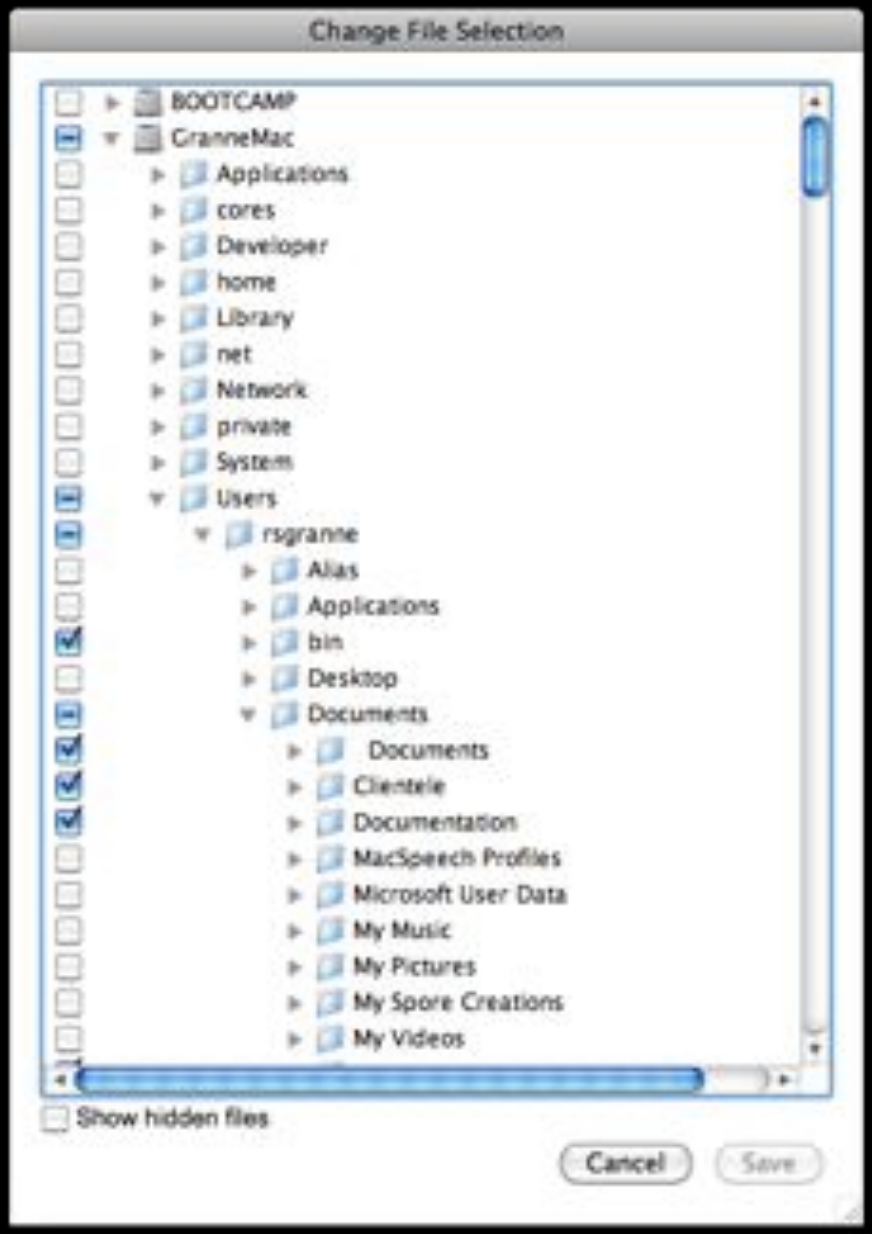
CRASHPLANPRO
Continuous Backup for Business.

Business and Enterprise

- 10+ Computers
- Powerful Enterprise Features
- Offsite Laptop Protection
- Mac, Windows, Linux, Solaris

CrashPlan
CRASHPLAN
Backup
Restore
Settings
History
Friends
Destinations
Welcome to CrashPlan
Click Start Backup to back up your files to CrashPlan Central or choose other destinations for greater speed, security and no monthly fees.
Backup Destinations
CrashPlan Central
Friend
Another Computer
Folder
Files to Back Up
Users > ngranne > .bash_aliases 1 file 5.7 KB
Users > ngranne > .bash_history 1 file 13.4 KB
Users > ngranne > .bashrc 1 file 1.1 KB
Users > ngranne > .gnupg 33 files 8.4 MB
Users > ngranne > .keepassx 2 files 1.4 KB
Users > ngranne > .profile 1 file 742 Bytes
Users > ngranne > .ssh 8 files 57.2 KB
Users > ngranne > .vim 89 files 520.3 KB
Users > ngranne > .viminfo 1 file 15.5 KB
Users > ngranne > .vimoutliner 7 files 11.2 KB
Users > ngranne > .vimrc 1 file 15.3 KB
Users > ngranne > .vimrecent 1 file 656 Bytes
Users > ngranne > .wgetrc 1 file 34 Bytes
Users > ngranne > bin 1,040 files 14.4 MB
Users > ngranne > Documents > Documents 2 files 0 MB
Users > ngranne > Documents > Clientele 7,794 files 1.4 GB
drobo
Need more storage?
Check out Drobo—instantly expandable & redundant.
casper suite
The Casper Suite simplifies the life of system administrators with one tool to inventory, image, update, and maintain Macs.

CRASHPLAN


Change File Selection
BOOTCAMP
GranneMac
Applications
cores
Developer
home
Library
net
Network
private
System
Users
rsgranne
Alias
Applications
bin
Desktop
Documents
Documents
Clientele
Documentation
MacSpeech Profiles
Microsoft User Data
My Music
My Pictures
My Spore Creations
My Videos
Show hidden files
Cancel
Save

CRASHPLAN

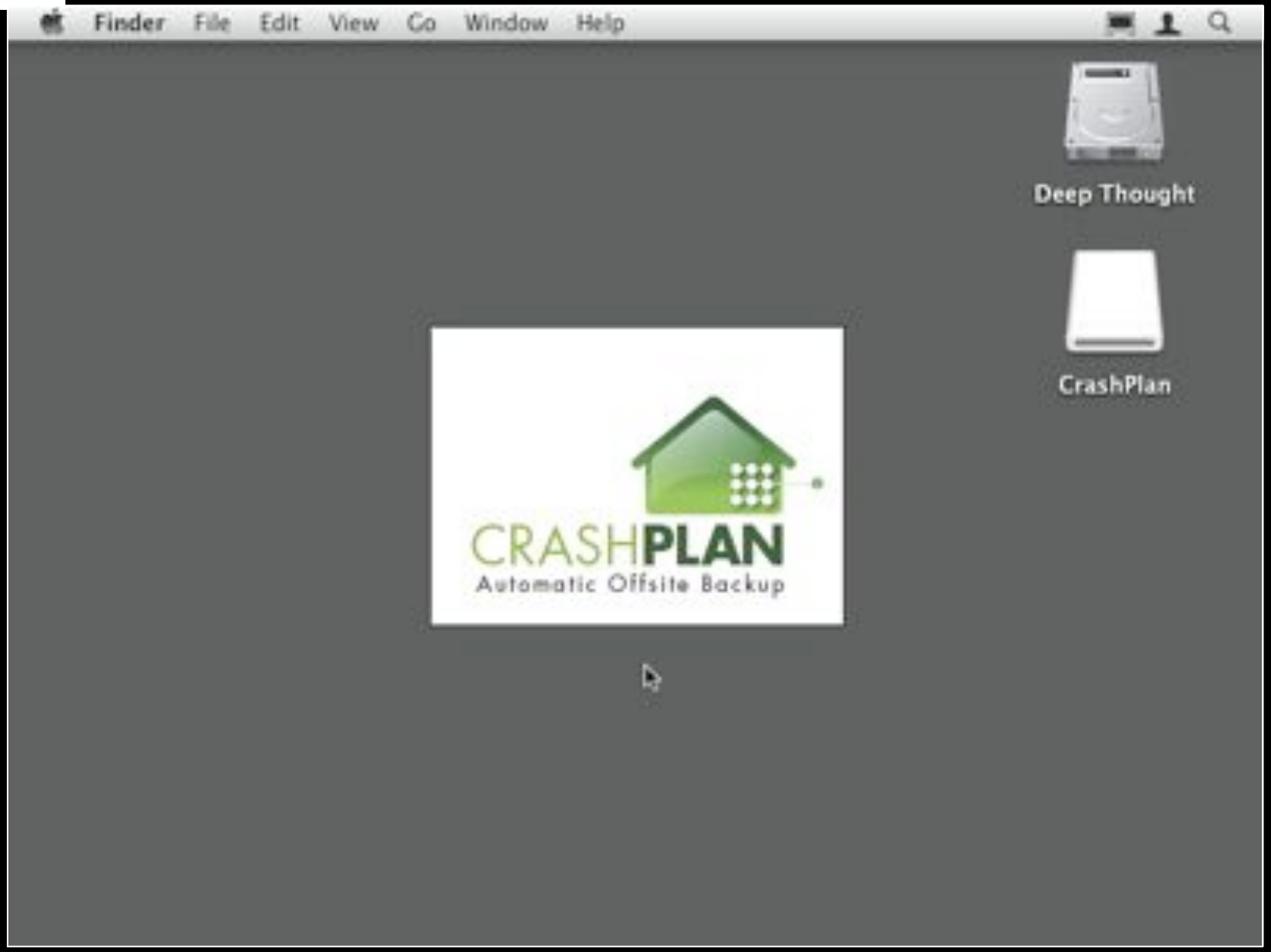
CrashPlan provides secure unlimited backup to multiple destinations. Add destinations to improve your CrashPlan:

Back up to a friend's computer and pay no monthly fees. Need more room? Attach an external drive to the PC.

Back up between your computers. Laptop to desktop, home to office, Mac to PC... it all works!

Back up directly to an attached drive. Move drive to a remote PC to continue offsite protection.

Back up to your favorite third-party provider online.


Finder File Edit View Co Window Help
Deep Thought
CrashPlan
CRASHPLAN
Automatic Offsite Backup

CRASHPLAN

128-bit SSL encryption
during transport

Data encryption
with 128-bit Blowfish

CRASHPLAN

solaris

1 PC/$54/year

All PCs/$100/year

Unlimited data

Others

Carbonite

http://www.carbonite.com

SugarSync

http://www.sugarsync.com

Box.net

http://www.box.net

Wuala

http://www.wuala.com

Personally, I use

Dropbox

CrashPlan

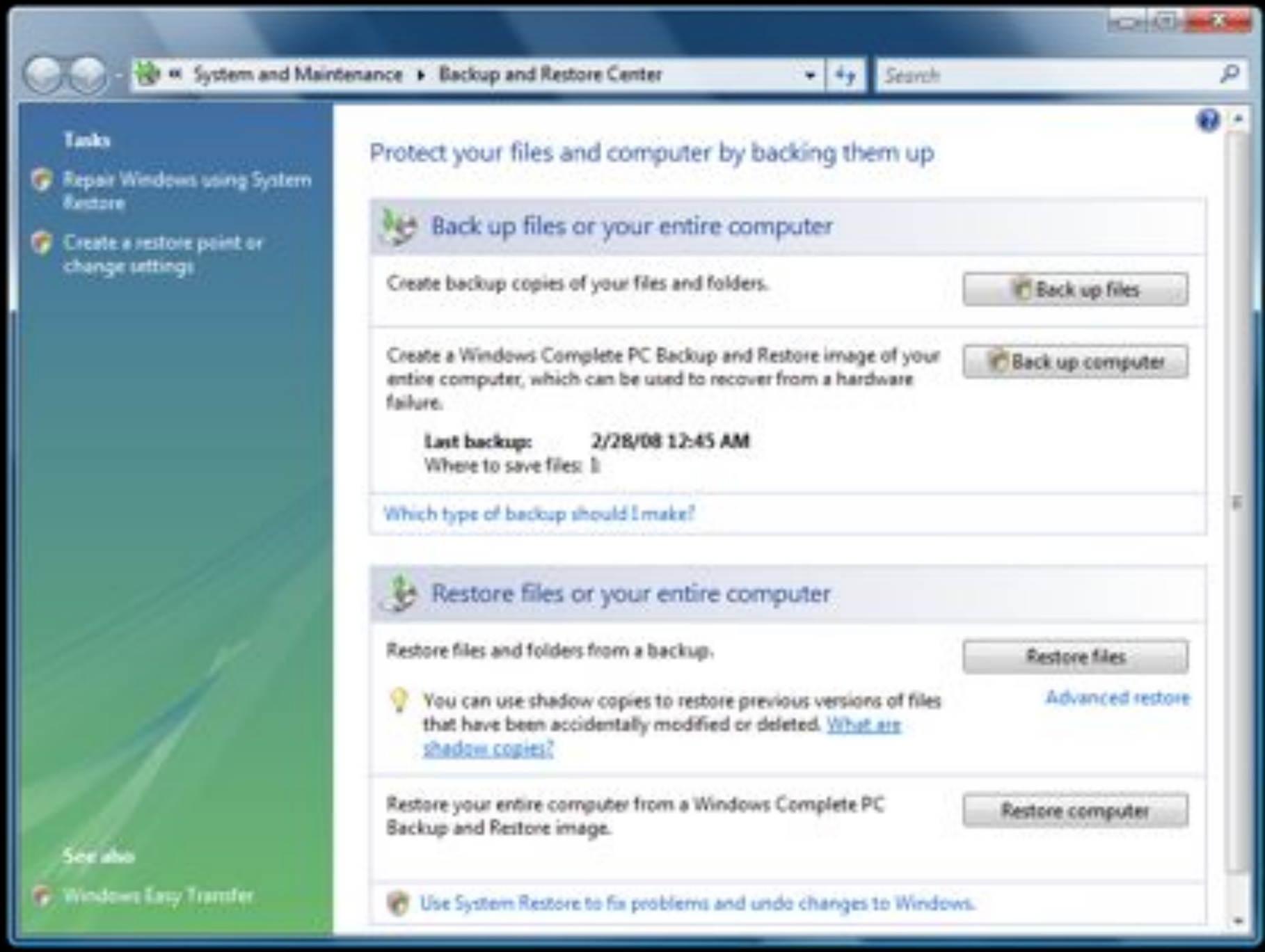
Amazon S3

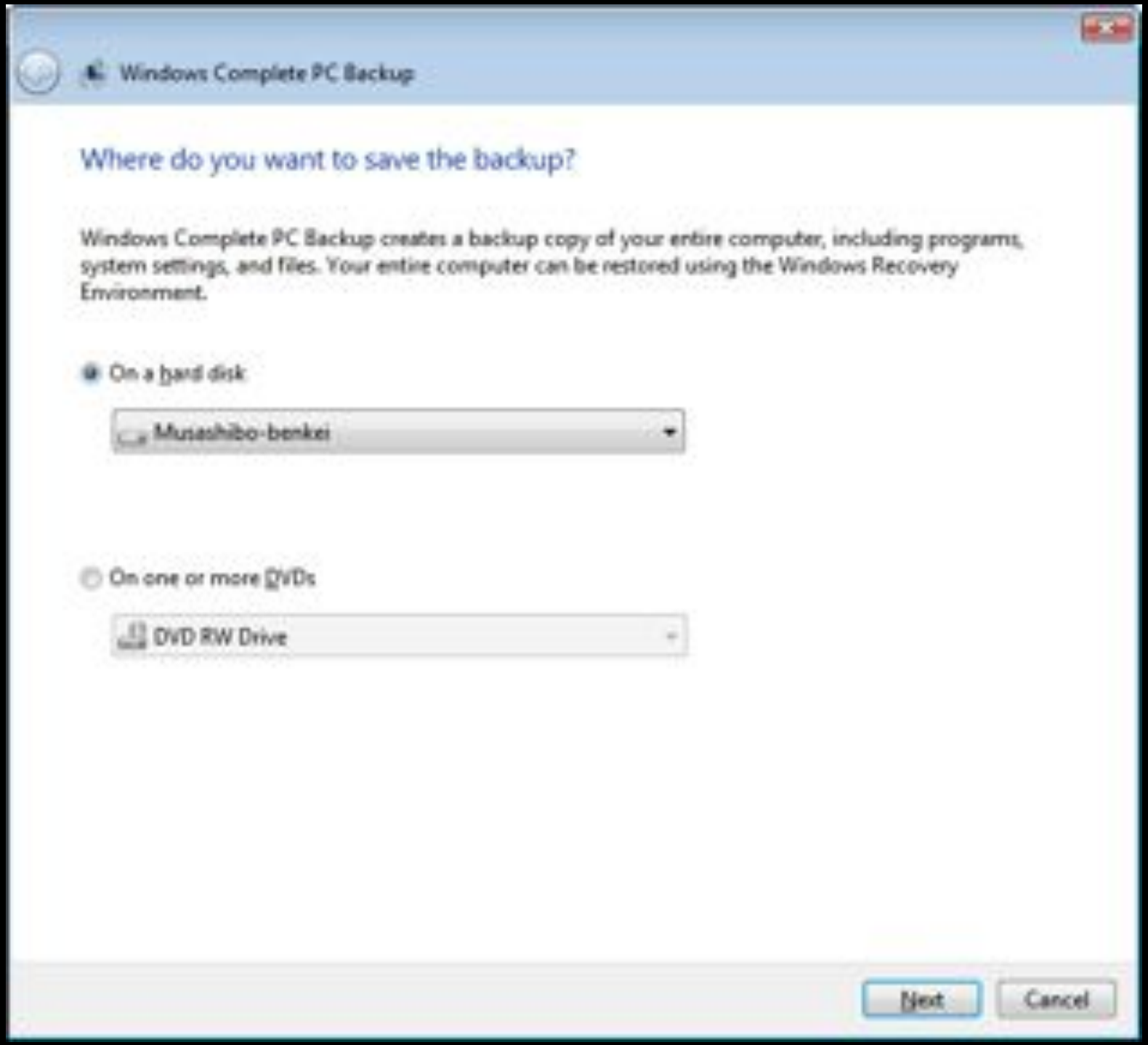
Backing Up Data: Local

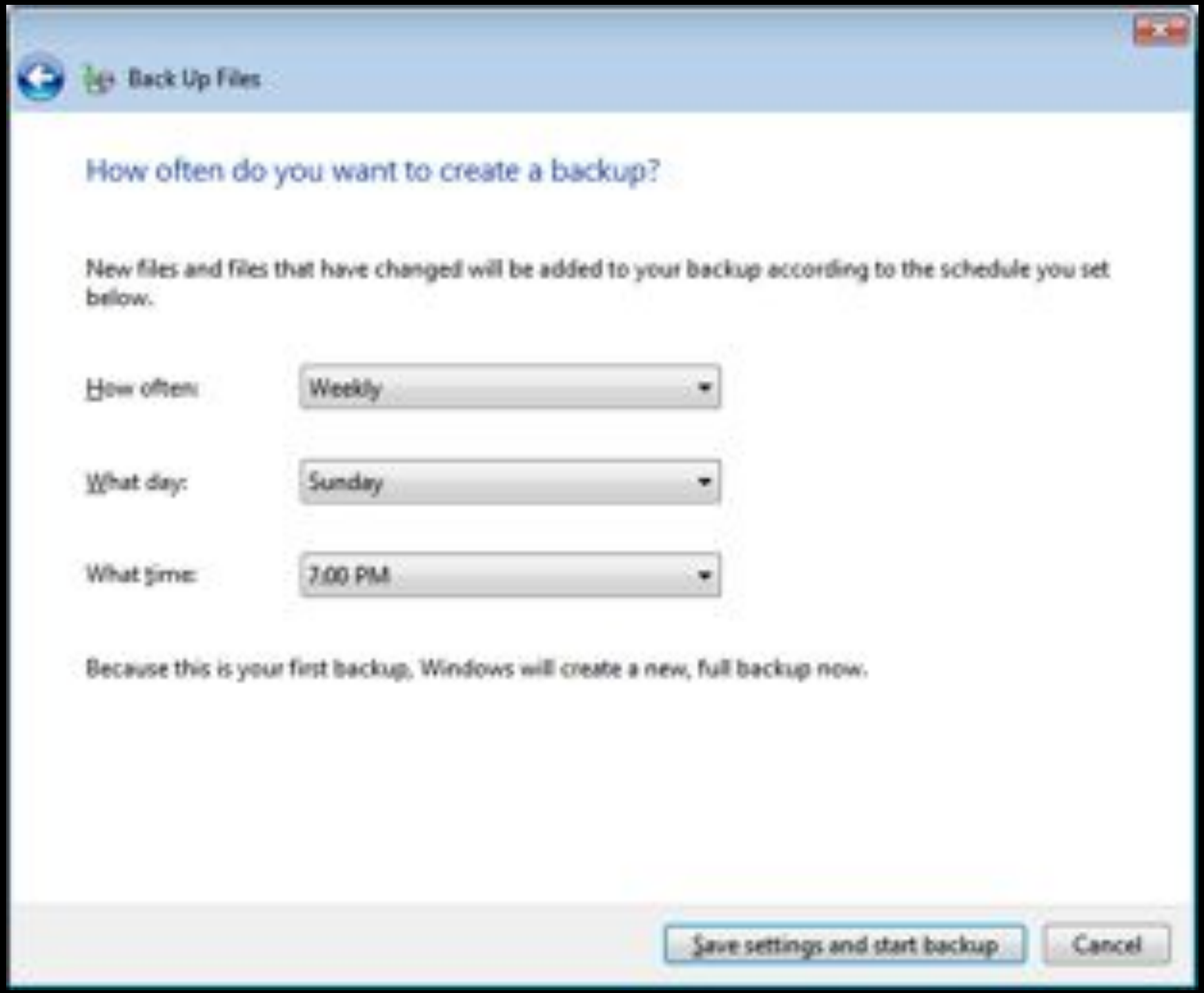
Time Machine

Desktop
Leopard shots
Cancel
Today (Now)

Backup and Restore Center


« System and Maintenance ▸ Backup and Restore Center
Search
Tasks
Repair Windows using System Restore
Create a restore point or change settings
See also
Windows Easy Transfer
Protect your files and computer by backing them up
Back up files or your entire computer
Create backup copies of your files and folders.
Back up files
Create a Windows Complete PC Backup and Restore image of your entire computer, which can be used to recover from a hardware failure.
Back up computer
Last backup: 2/28/08 12:45 AM
Where to save files: I:
Which type of backup should I make?
Restore files or your entire computer
Restore files and folders from a backup.
Restore files
Advanced restore
You can use shadow copies to restore previous versions of files that have been accidentally modified or deleted. What are shadow copies?
Restore your entire computer from a Windows Complete PC Backup and Restore image.
Restore computer
Use System Restore to fix problems and undo changes to Windows.

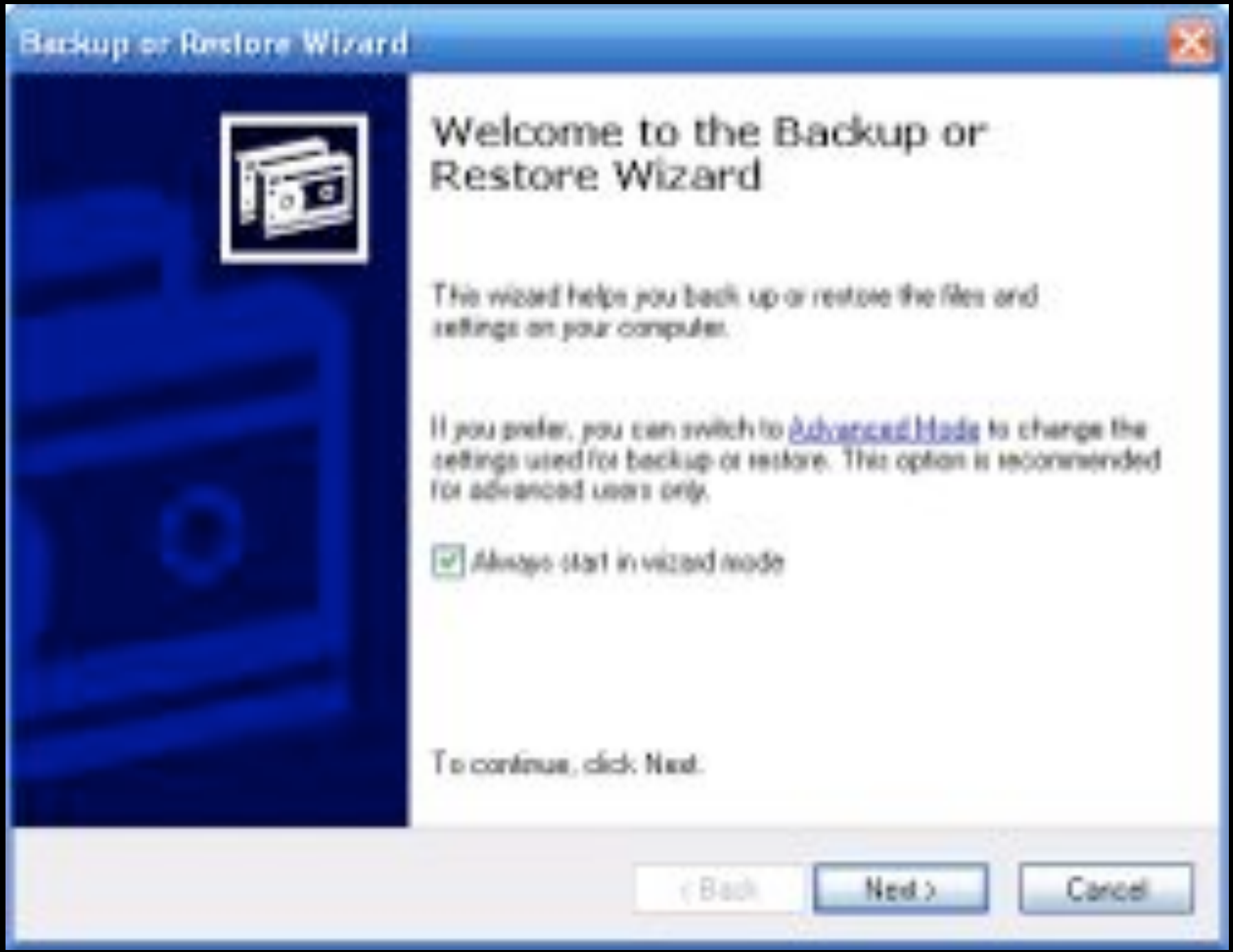

Windows Complete PC Backup
Where do you want to save the backup?
Windows Complete PC Backup creates a backup copy of your entire computer, including programs, system settings, and files. Your entire computer can be restored using the Windows Recovery Environment.
On a hard disk
Musashibo-benkei
On one or more DVDs
DVD RW Drive
Next
Cancel

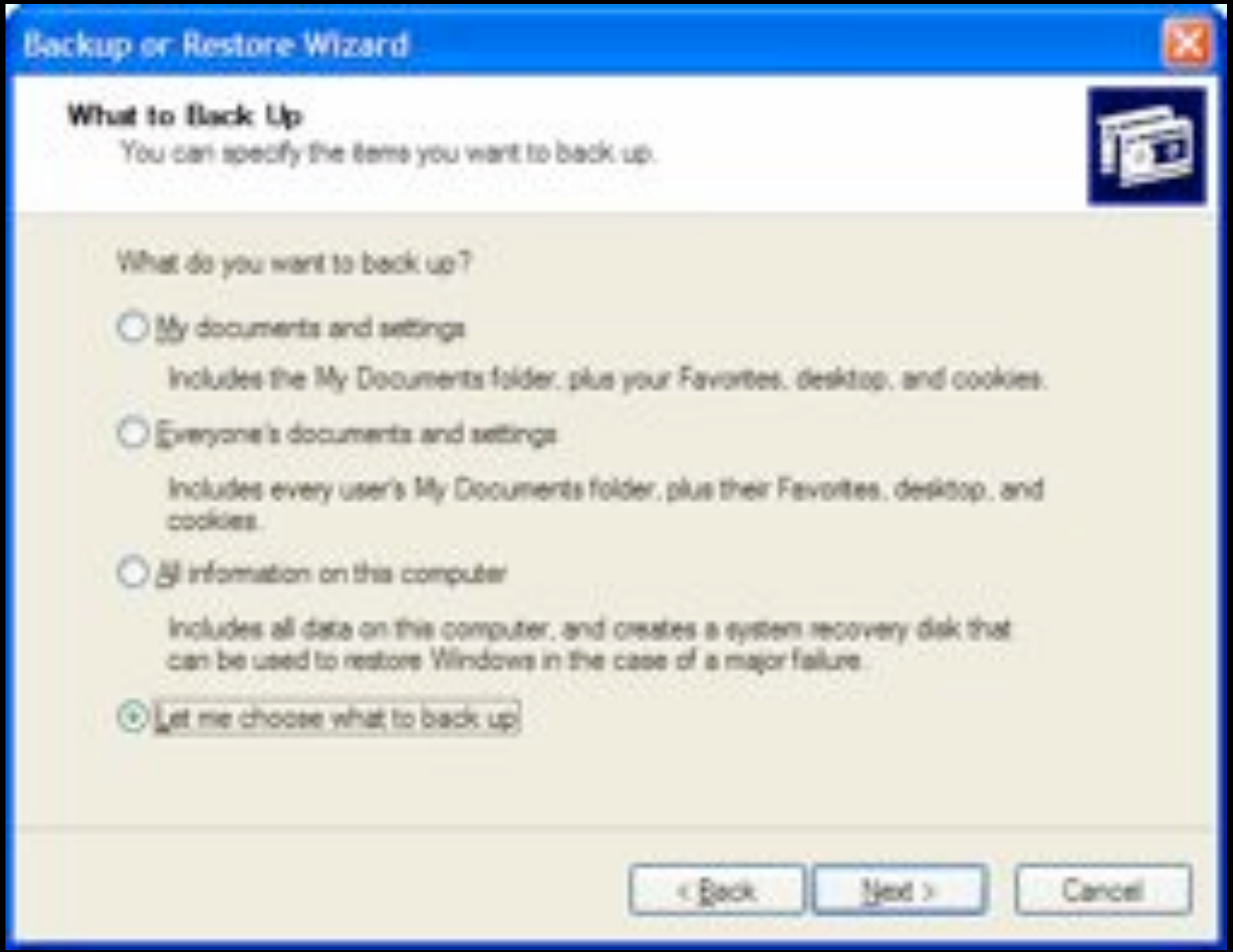

Back Up Files
How often do you want to create a backup?
New files and files that have changed will be added to your backup according to the schedule you set below.
How often:
Weekly
What day:
Sunday
What time:
7:00 PM
Because this is your first backup, Windows will create a new, full backup now.
Save settings and start backup
Cancel

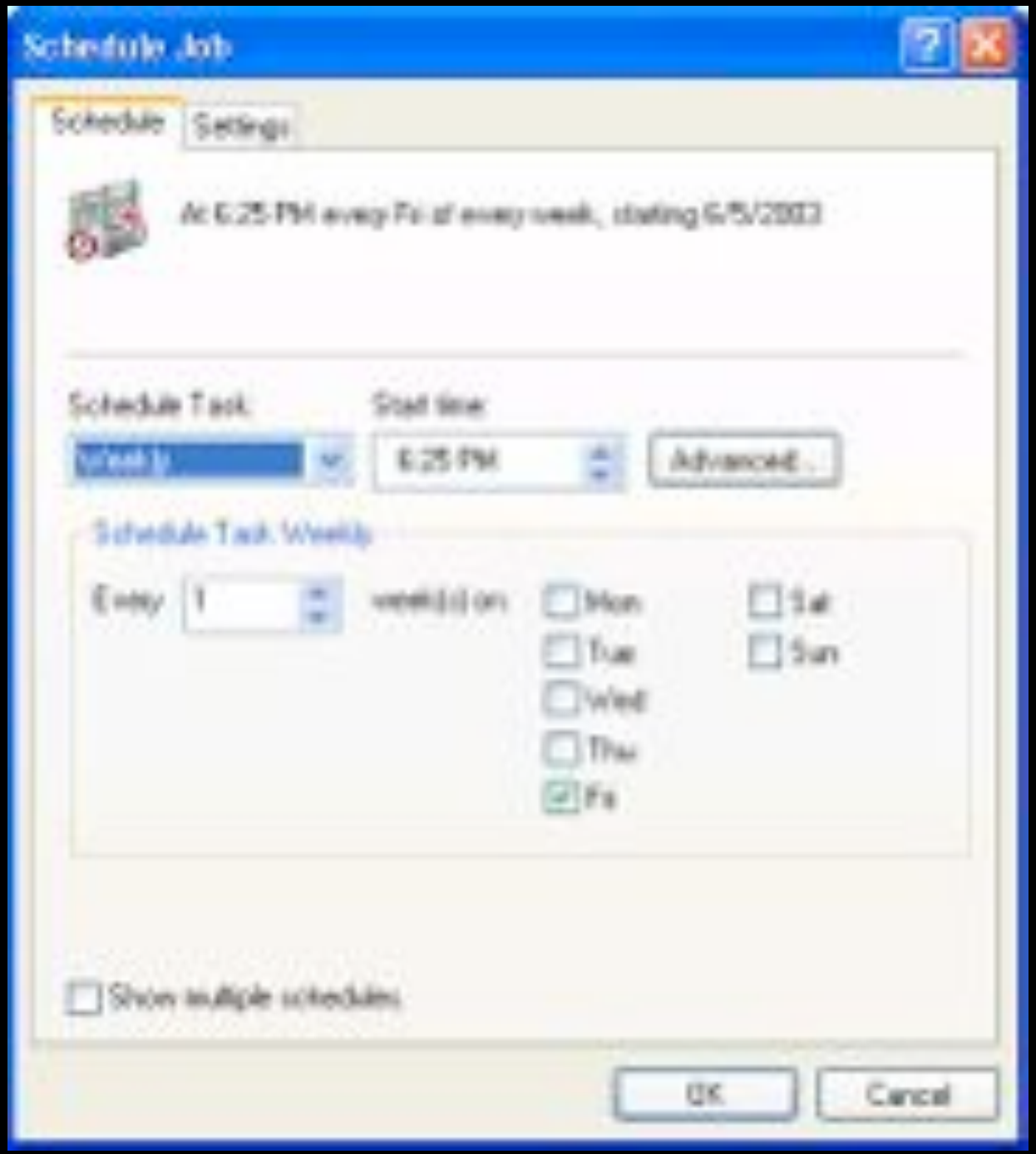
Cannot specify files or folders
to be backed up or skipped

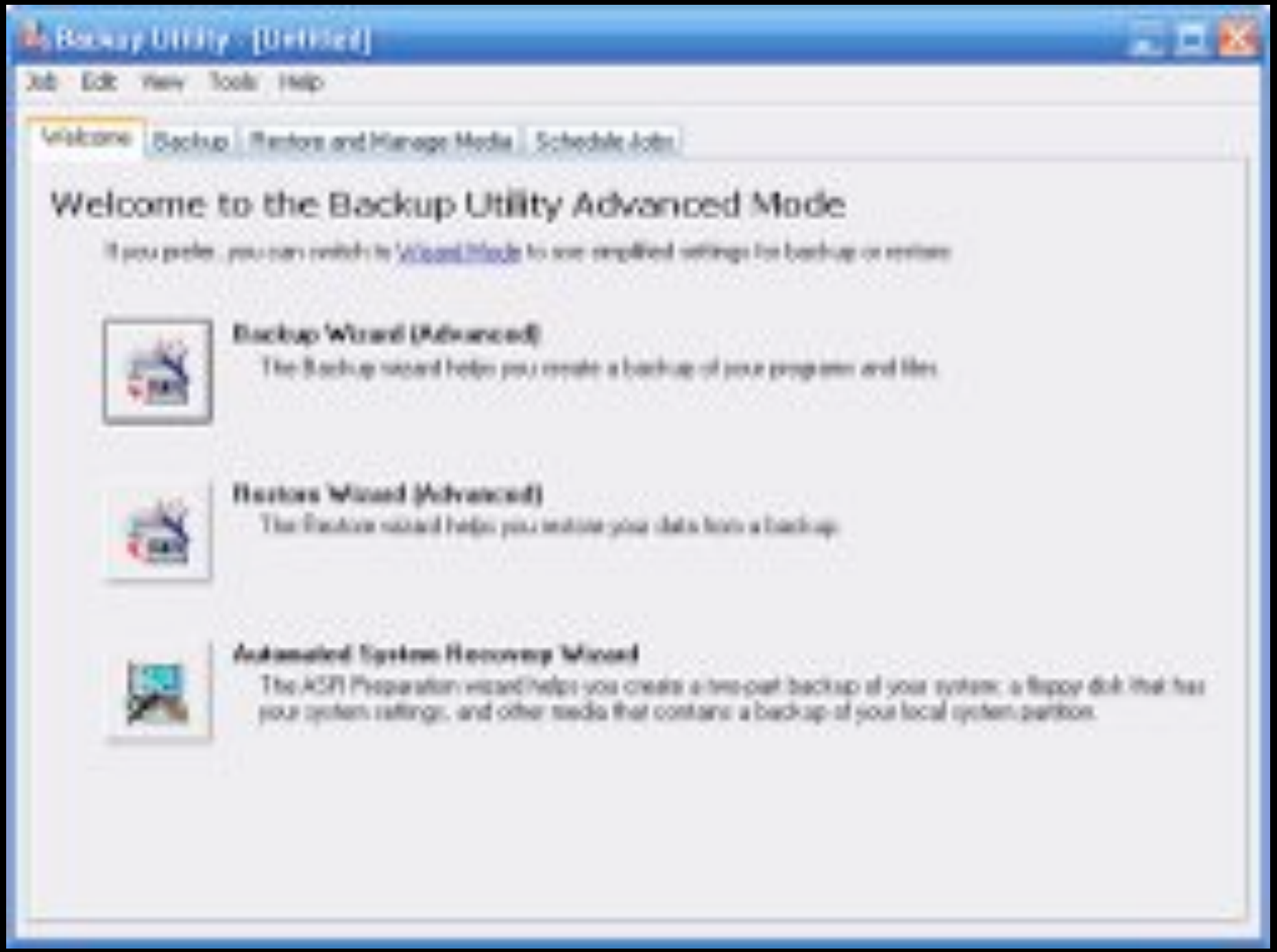
	Backup Personal Files	Backup System Files	Complete PC Backup	Automated Backup
Home Basic	✓			
Home Premium	✓			✓
Business	✓	✓	✓	✓
Enterprise	✓	✓	✓	✓
Ultimate	✓	✓	✓	✓

Backup

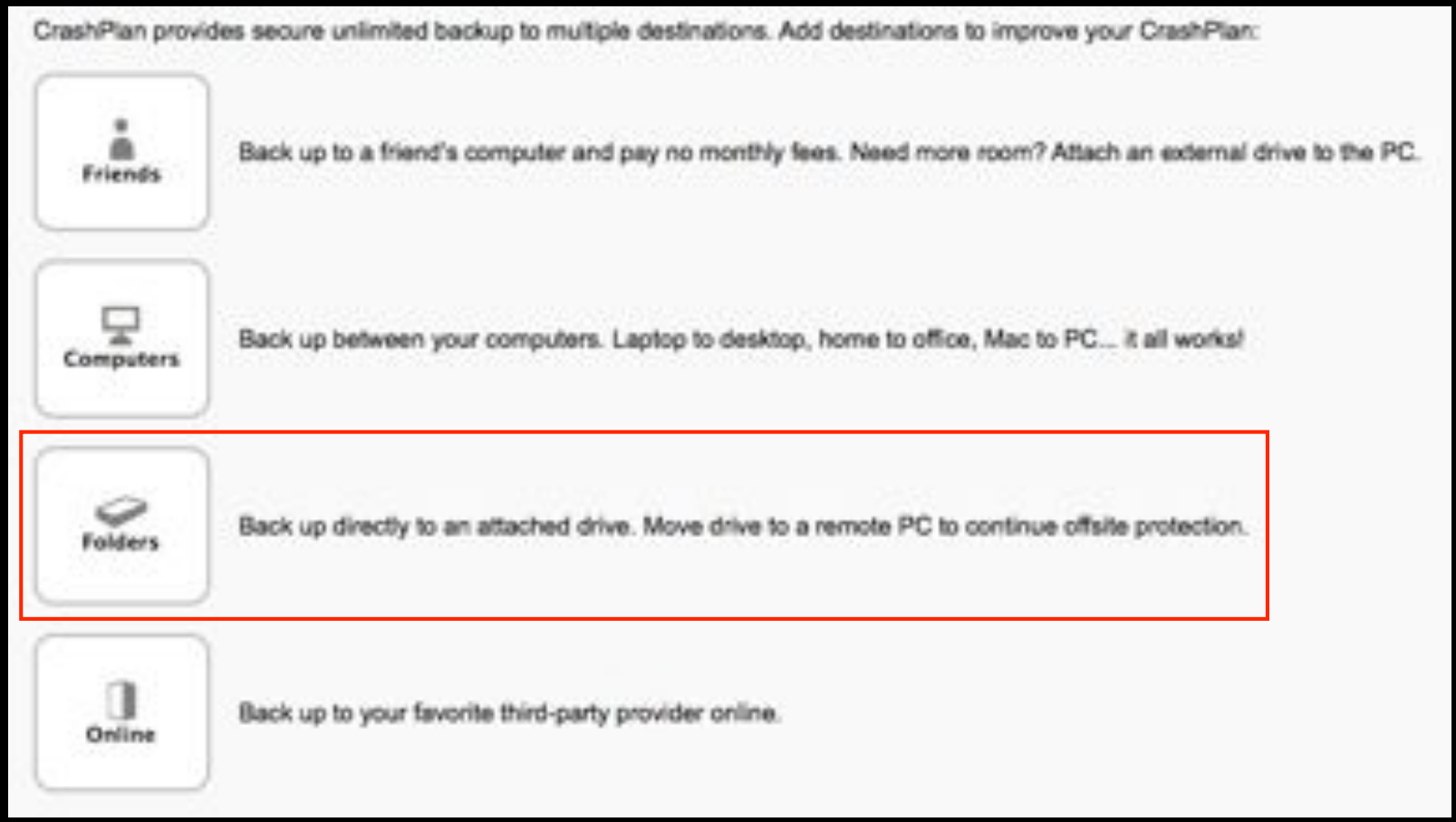

Backup or Restore Wizard
Welcome to the Backup or Restore Wizard
This wizard helps you back up or restore the files and settings on your computer.
If you prefer, you can switch to Advanced Mode to change the settings used for backup or restore. This option is recommended for advanced users only.
Always start in wizard mode
To continue, click Next.
< Back
Next >
Cancel


Backup or Restore Wizard
What to Back Up
You can specify the items you want to back up.
What do you want to back up?
My documents and settings
Includes the My Documents folder, plus your Favorites, desktop, and cookies.
Everyone's documents and settings
Includes every user's My Documents folder, plus their Favorites, desktop, and cookies.
All information on this computer
Includes all data on this computer, and creates a system recovery disk that can be used to restore Windows in the case of a major failure.
Let me choose what to back up
< Back
Next >
Cancel


Schedule Job
Schedule
Settings
Schedule Task:
Start time:
6:25 PM
Advanced...
Every
1
Mon
Tue
Wed
Thu
Fri
Sat
Sun
OK
Cancel


Job Edit View Tools Help
Welcome
Backup
Restore and Manage Media
Schedule Jobs
Welcome to the Backup Utility Advanced Mode
Backup Wizard (Advanced)
Restore Wizard (Advanced)
Automated System Recovery Wizard

CrashPlan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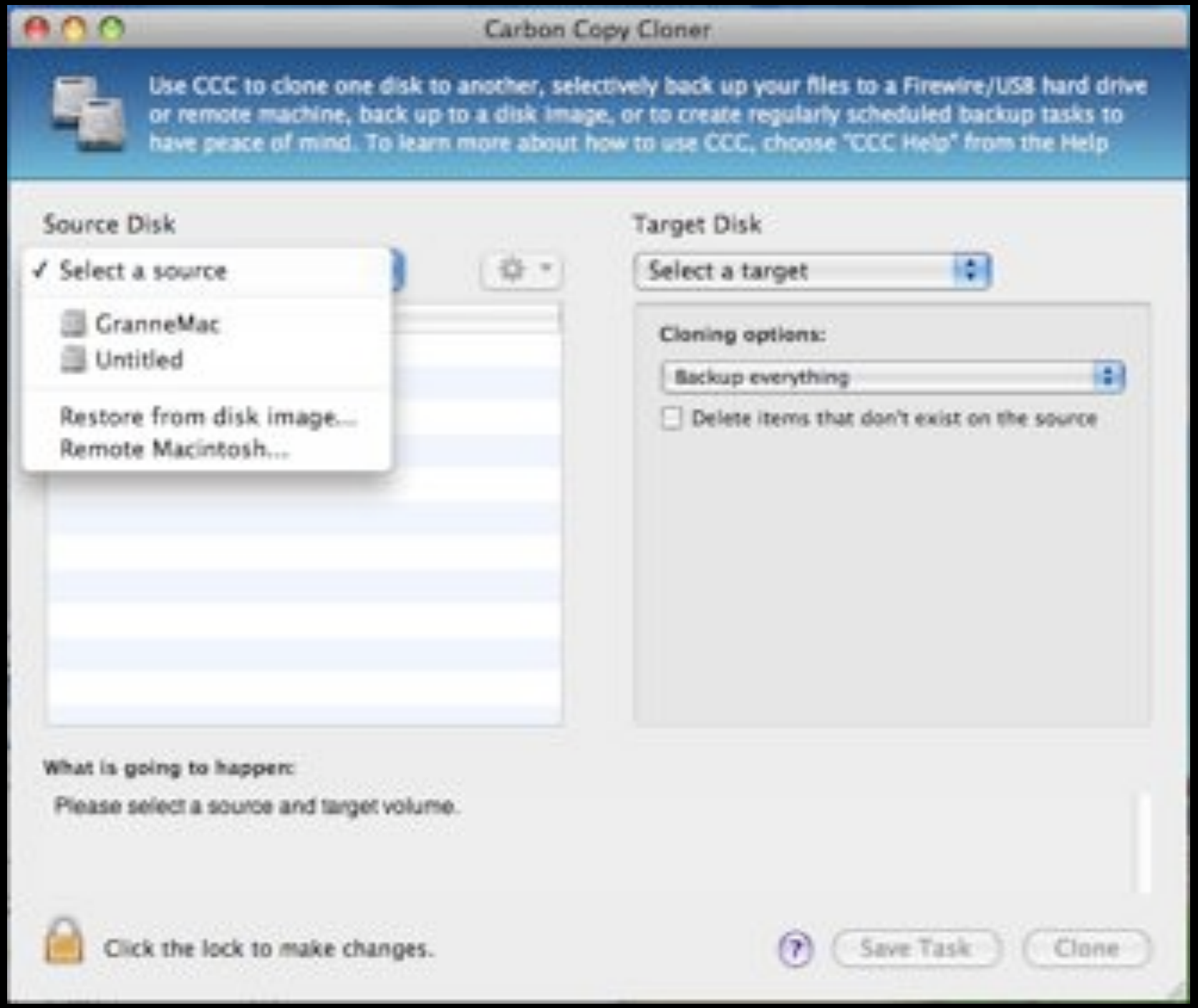
Back up to a friend's computer and pay no monthly fees. Need more room? Attach an external drive to the PC.
Computers
Back up between your computers. Laptop to desktop, home to office, Mac to PC... it all works!
Folders
Back up directly to an attached drive. Move drive to a remote PC to continue offsite protection.
Online
Back up to your favorite third-party provider online.

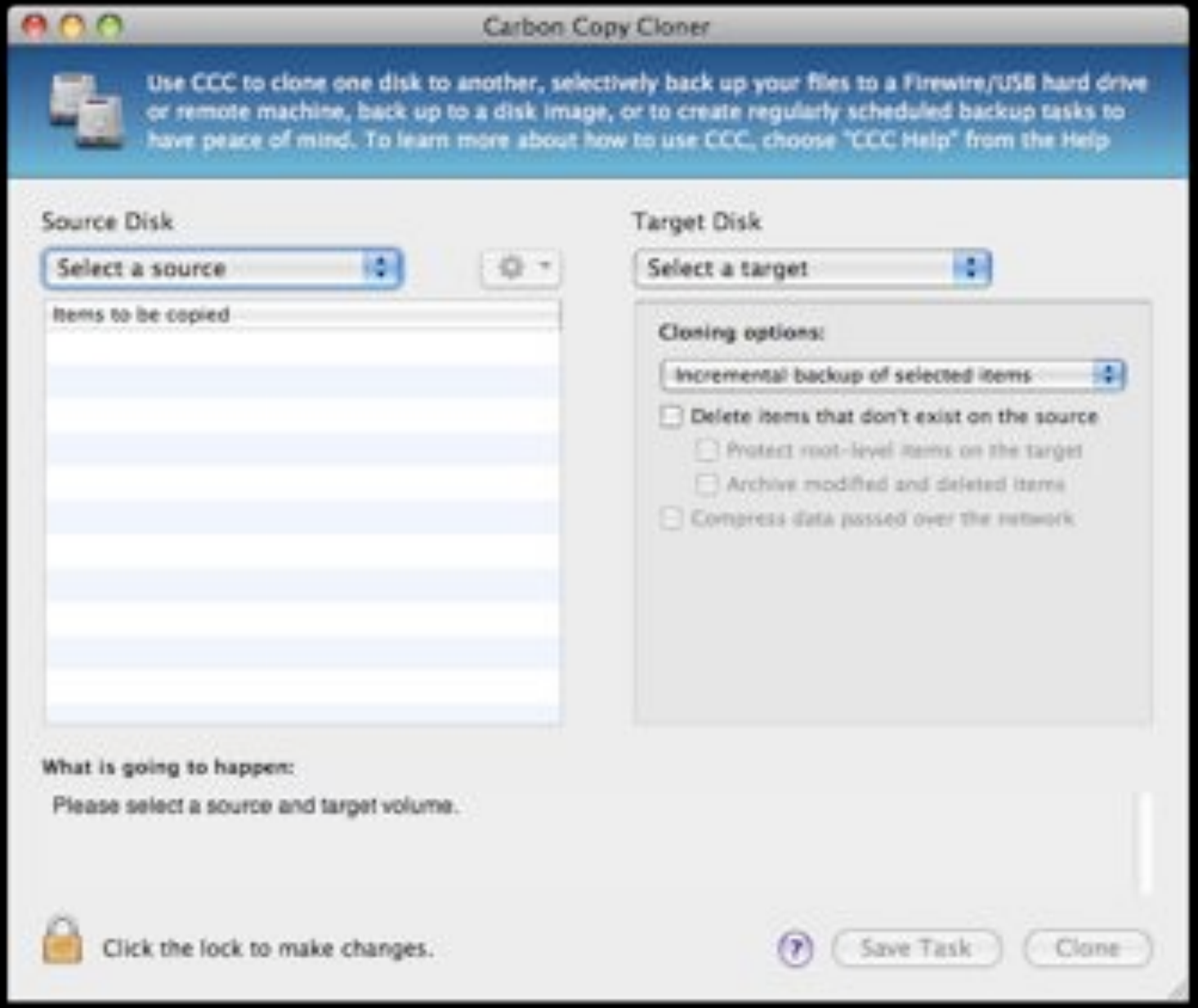
Cloning

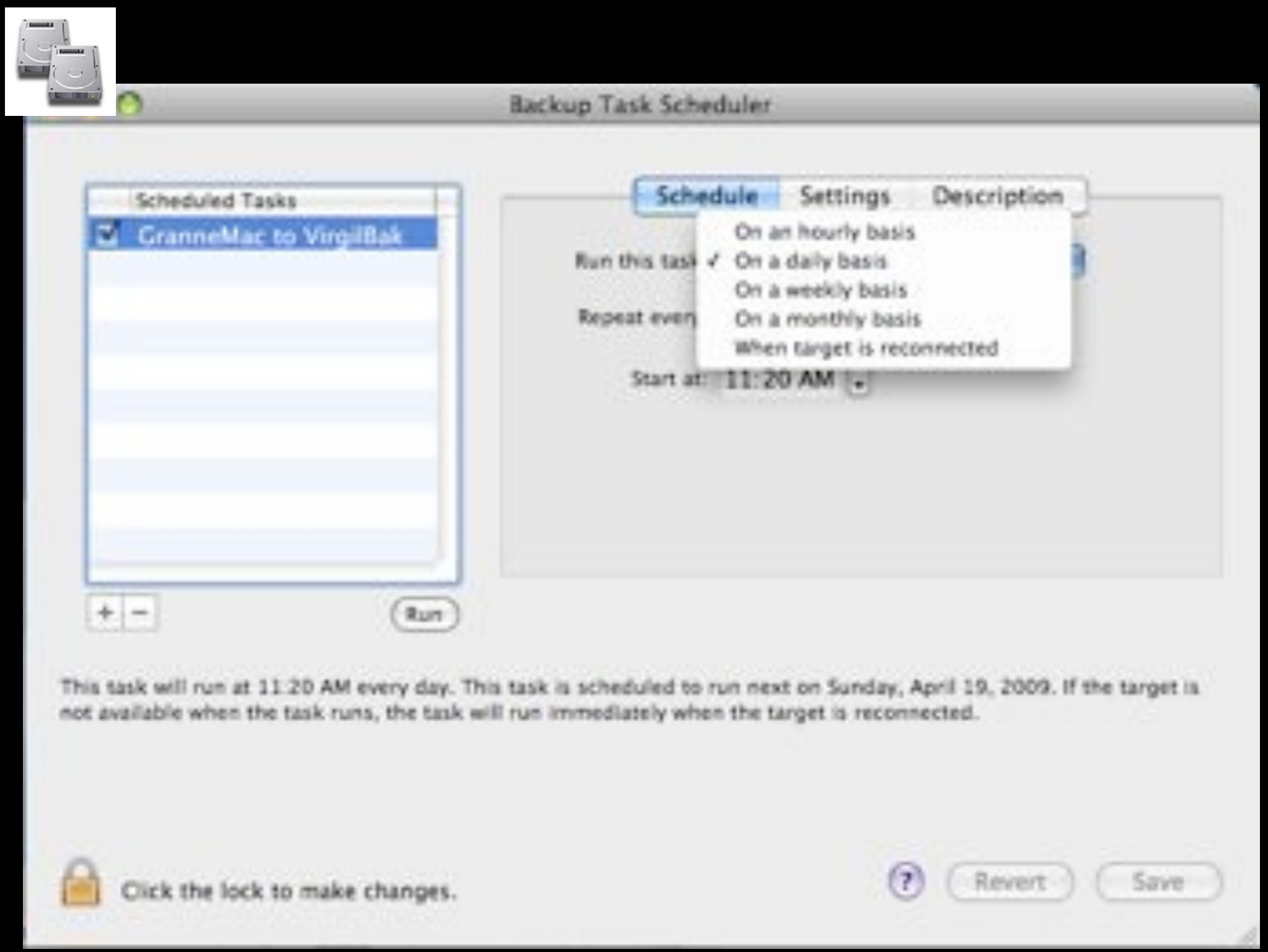
Carbon Copy Cloner

ORANGE
MEDIA
NETWORK

MacAppGuide.com


Carbon Copy Cloner
Use CCC to clone one disk to another, selectively back up your files to a Firewire/USB hard drive or remote machine, back up to a disk image, or to create regularly scheduled backup tasks to have peace of mind. To learn more about how to use CCC, choose "CCC Help" from the Help
Source Disk
✓ Select a source
GranneMac
Untitled
Restore from disk image...
Remote Macintosh...
Target Disk
Select a target
Cloning options:
Backup everything
Delete items that don't exist on the source
What is going to happen:
Please select a source and target volume.
Click the lock to make changes.
Save Task
Clone


Carbon Copy Cloner
Use CCC to clone one disk to another, selectively back up your files to a Firewire/USB hard drive or remote machine, back up to a disk image, or to create regularly scheduled backup tasks to have peace of mind. To learn more about how to use CCC, choose "CCC Help" from the Help
Source Disk
Select a source
Items to be copied
Target Disk
Select a target
Cloning options:
Incremental backup of selected items
Delete items that don't exist on the source
Protect root-level items on the target
Archive modified and deleted items
Compress data passed over the network
What is going to happen:
Please select a source and target volume.
Click the lock to make changes.
Save Task
Clone


Backup Task Scheduler
Scheduled Tasks
GranneMac to VirgilBak
Schedule
Settings
Description
Run this task
On an hourly basis
On a daily basis
On a weekly basis
On a monthly basis
When target is reconnected
Repeat even
Start at: 11:20 AM
Run
This task will run at 11:20 AM every day. This task is scheduled to run next on Sunday, April 19, 2009. If the target is not available when the task runs, the task will run immediately when the target is reconnected.
Click the lock to make changes.
Revert
Save

Backup to local or network storage

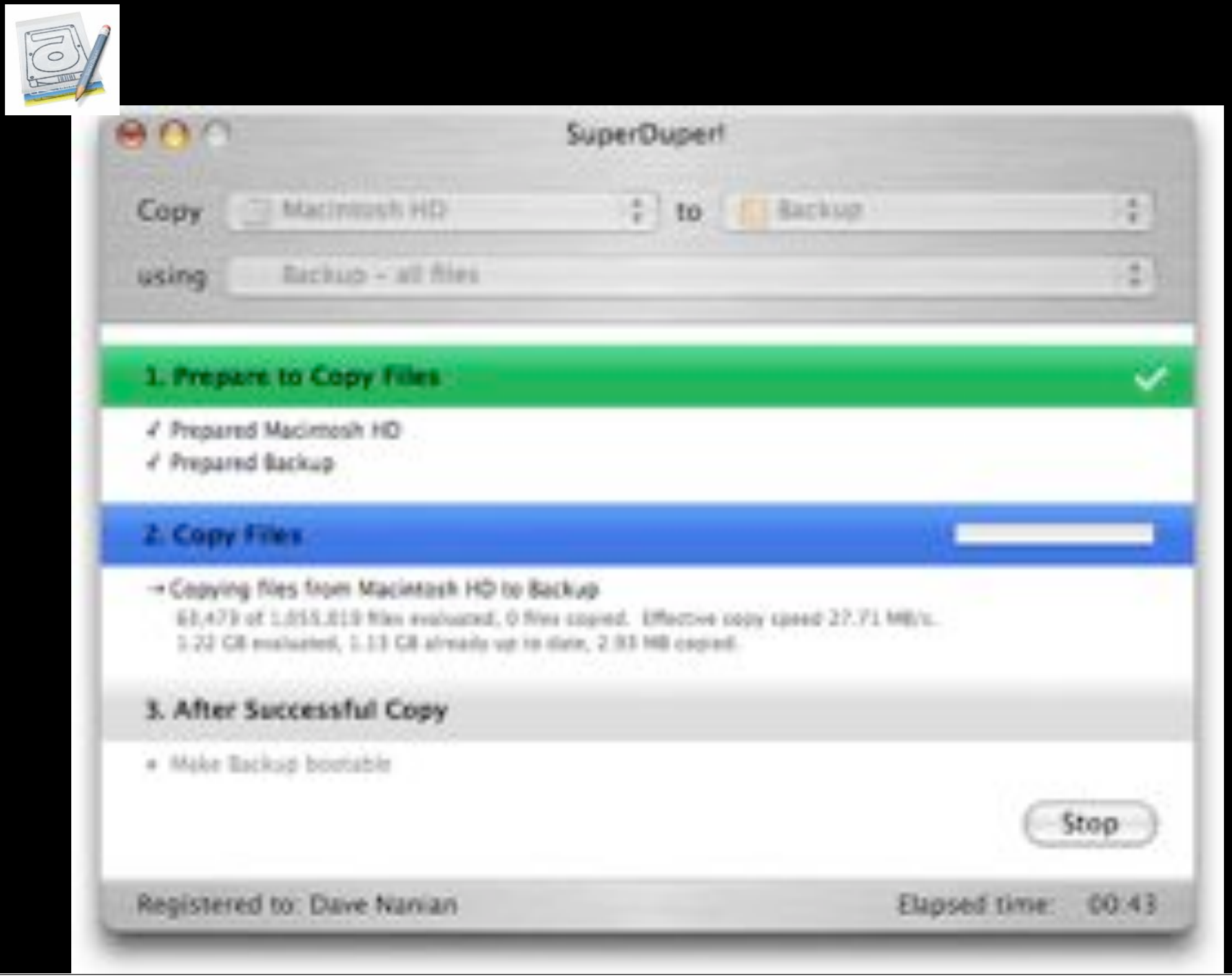
Backup to drives or images

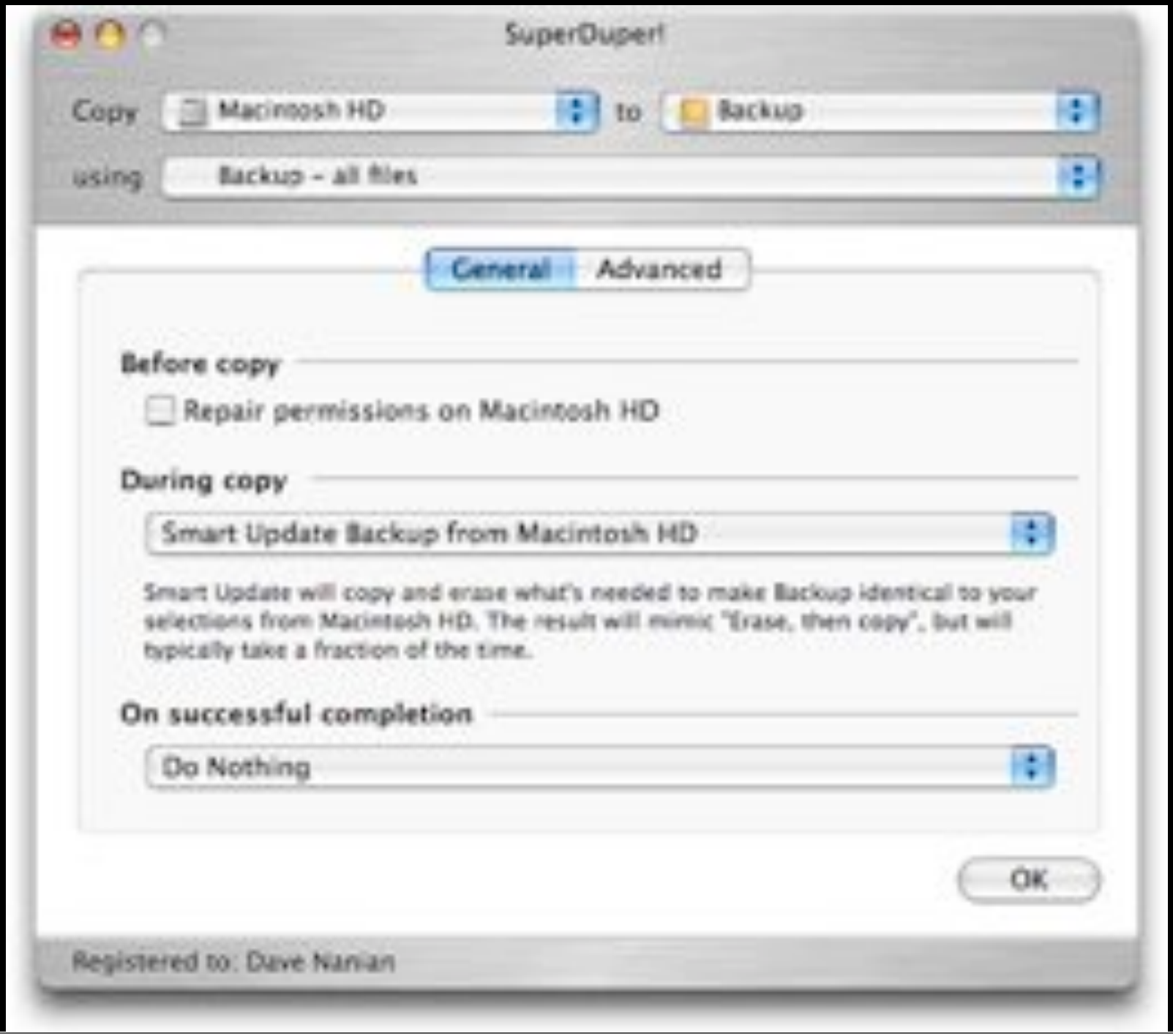
Scheduled backups

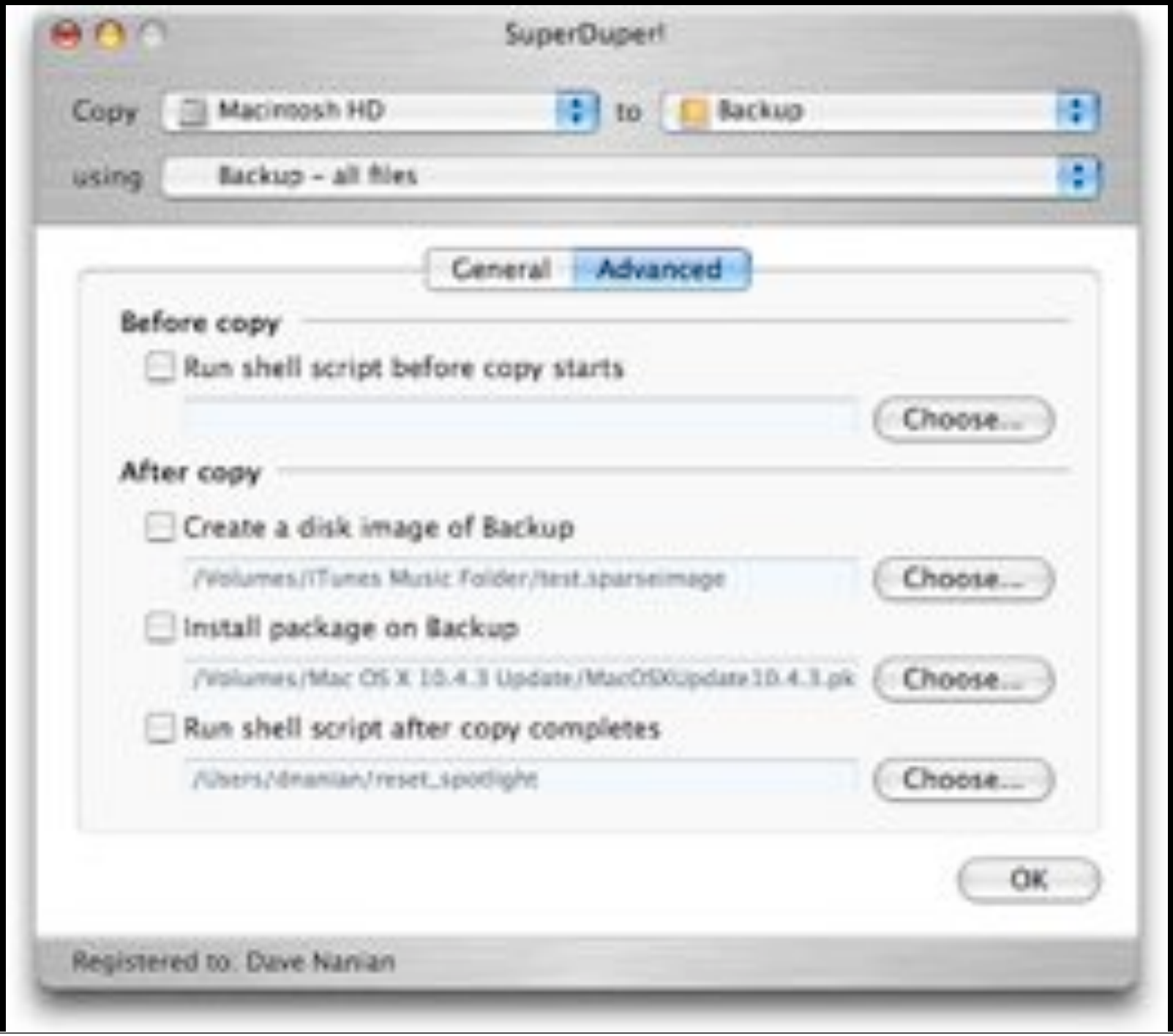
$40

SuperDuper!

SuperDuper!
Copy
Macintosh HD
to
Backup
using
Backup – all files
What's going to happen?
Pressing "Copy Now" will use "Backup - all files" to copy Macintosh HD to Backup. All files on Macintosh HD will be copied to Backup, except the temporary and system-specific files that Apple recommends excluding.
Smart Update will copy and erase what's needed to make Backup identical to your selections from Macintosh HD. The result will mimic "Erase Backup, then copy files from Macintosh HD", but will typically take a fraction of the time.
Click to require password authentication before copying.
Options...
Schedule...
Copy Now
Registered to: Dave Nanian


SuperDuper!
Copy
to
using
1. Prepare to Copy Files
Prepared Macintosh HD
Prepared Backup
2. Copy Files
3. After Successful Copy
Make Backup bootable
Stop
Registered to: Dave Nanian
Elapsed time:


SuperDuper!
Copy
Macintosh HD
to
Backup
using
Backup - all files
General
Advanced
Before copy
Repair permissions on Macintosh HD
During copy
Smart Update Backup from Macintosh HD
Smart Update will copy and erase what's needed to make Backup identical to your selections from Macintosh HD. The result will mimic "Erase, then copy", but will typically take a fraction of the time.
On successful completion
Do Nothing
OK
Registered to: Dave Nanian


SuperDuper!
Copy
Macintosh HD
to
Backup
using
Backup - all files
General
Advanced
Before copy
Run shell script before copy starts
Choose...
After copy
Create a disk image of Backup
/Volumes/iTunes Music Folder/test.sparseimage
Choose...
Install package on Backup
/Volumes/Mac OS X 10.4.3 Update/MacOSXUpdate10.4.3.pk
Choose...
Run shell script after copy completes
/Users/dnanian/reset_spotlight
Choose...
OK
Registered to: Dave Nanian

Scheduled Copies
Automatically copy Macintosh HD to Backup
Copy every:
1st
2nd
3rd
4th
week of the month
On:
Sun
Mon
Tue
Wed
Thu
Fri
Sat
Start copying at:
9 30 PM
What's going to happen?
Cancel
OK
Show Log...
Delete
Edit...

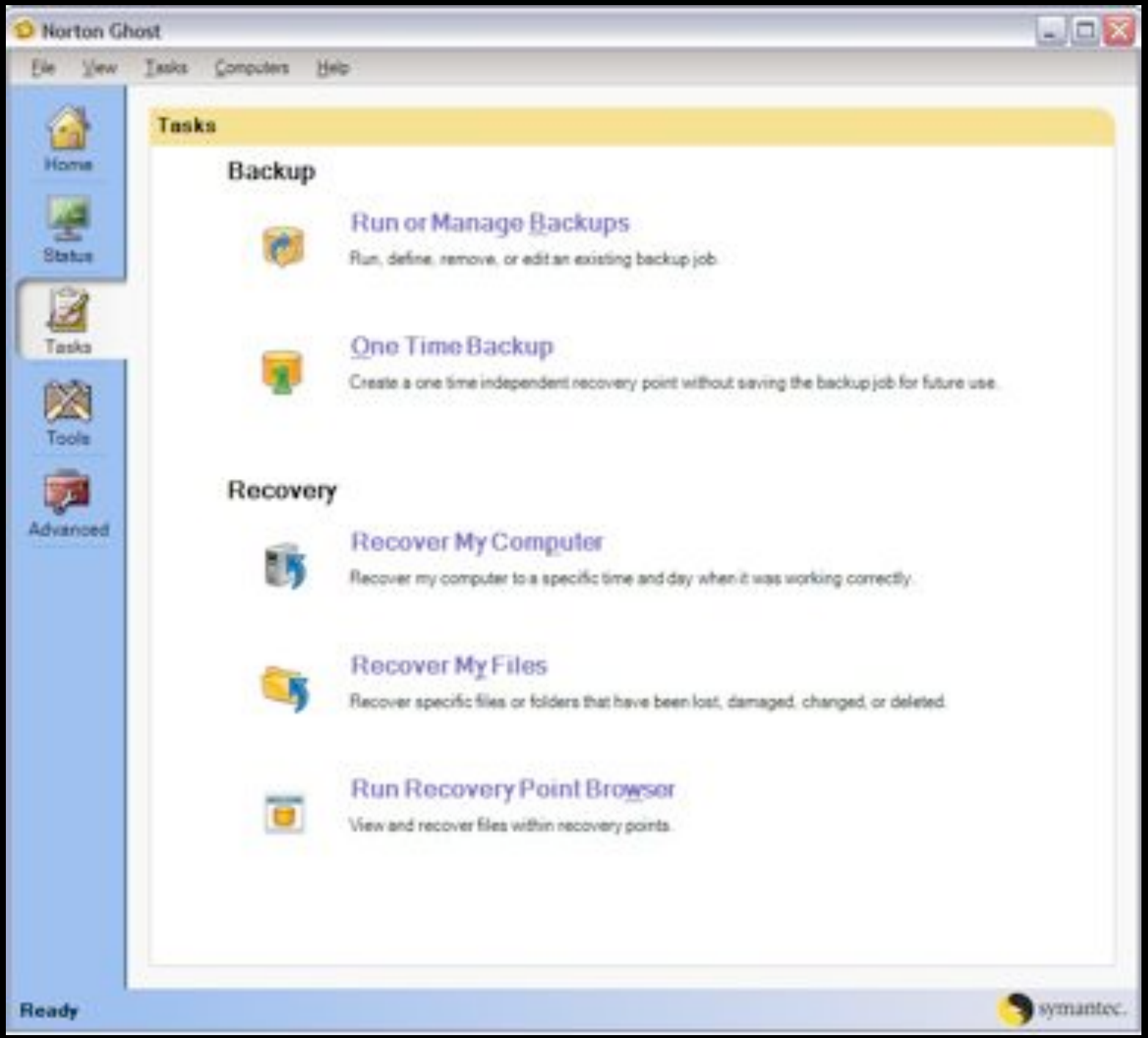
Free

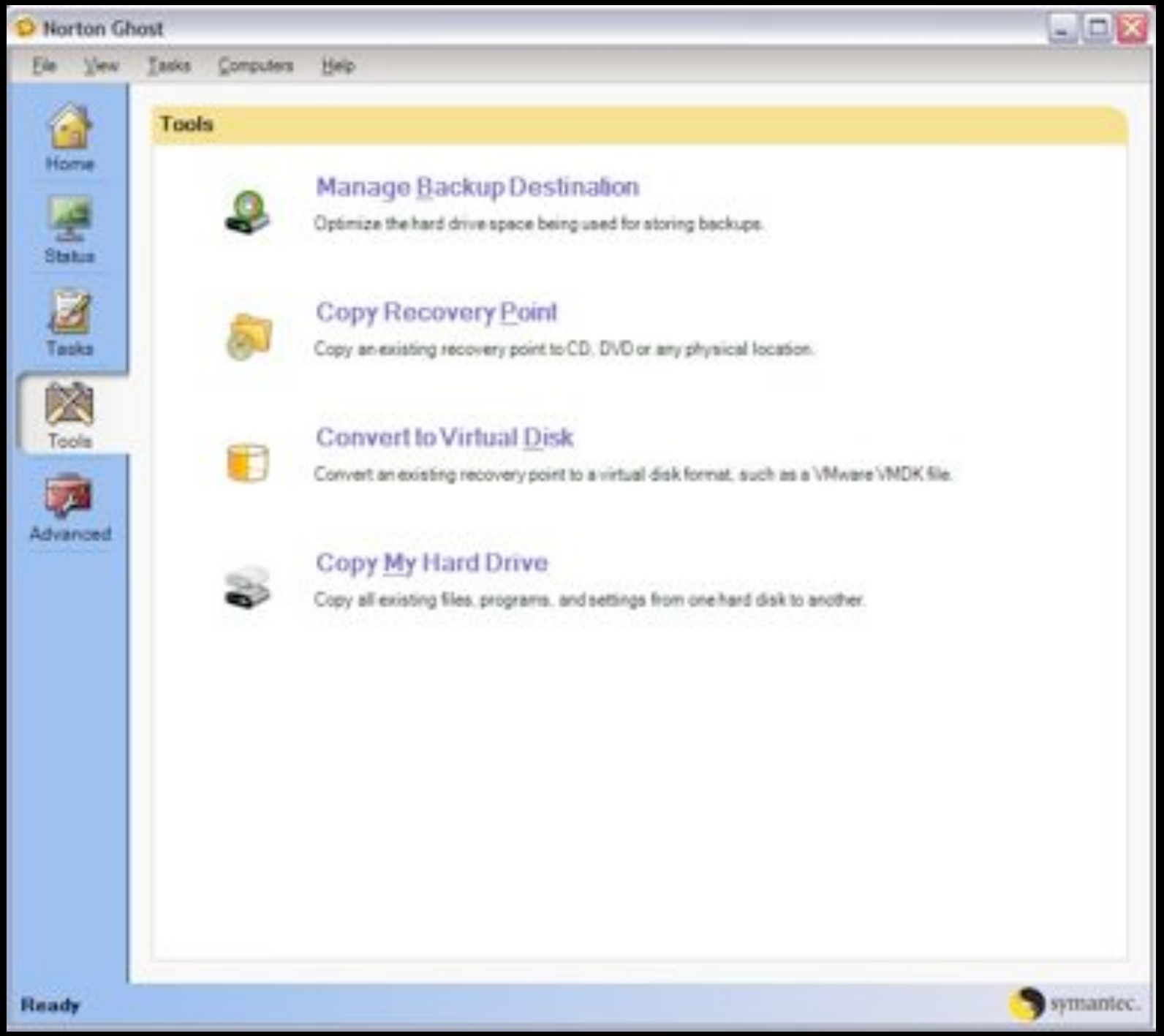
✓ $28
✓ Scheduled backups
✓ Smart Update
✓ Scripting

Ghost

Norton Ghost 2006 V10
How to make Backup

Norton Ghost
File View Tasks Computers Help
Home
Status
Tasks
Tools
Advanced
Backup Status
Status Details
This computer is currently protected by Norton Ghost. All recommended drives, files and folders are backed up.
Backed Up
Backup Destination
[FREECOM HDD] (F:)
Backup Data
Other Used Space
Free Space
Tasks
Backup
Run or Manage Backups
Recovery
Recover My Computer
Recover My Files
Tell Us What You Think
Send Feedback
Sent: 16/04/2008
Ready
symantec.


Norton Ghost
File View Tasks Computers Help
Home
Status
Tasks
Tools
Advanced
Tasks
Backup
Run or Manage Backups
Run, define, remove, or edit an existing backup job.
One Time Backup
Create a one time independent recovery point without saving the backup job for future use.
Recovery
Recover My Computer
Recover my computer to a specific time and day when it was working correctly.
Recover My Files
Recover specific files or folders that have been lost, damaged, changed, or deleted.
Run Recovery Point Browser
View and recover files within recovery points.
Ready
symantec.


Norton Ghost
File View Tasks Computers Help
Home
Status
Tasks
Tools
Advanced
Tools
Manage Backup Destination
Optimize the hard drive space being used for storing backups.
Copy Recovery Point
Copy an existing recovery point to CD, DVD or any physical location.
Convert to Virtual Disk
Convert an existing recovery point to a virtual disk format, such as a VMware VMDK file.
Copy My Hard Drive
Copy all existing files, programs, and settings from one hard disk to another.
Ready
symantec.

Backup & restore
to local or network storage

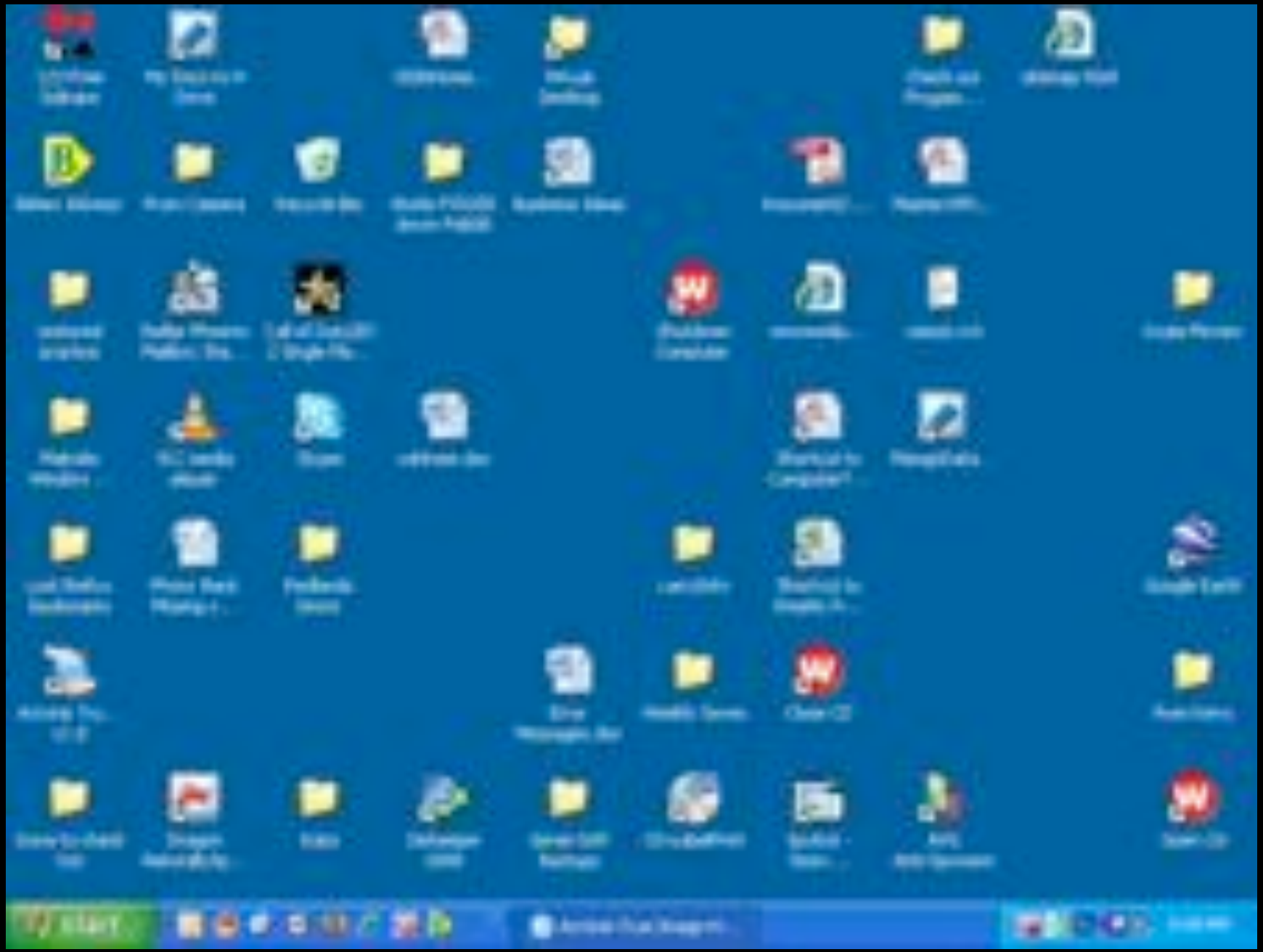
Ghost (home) $70

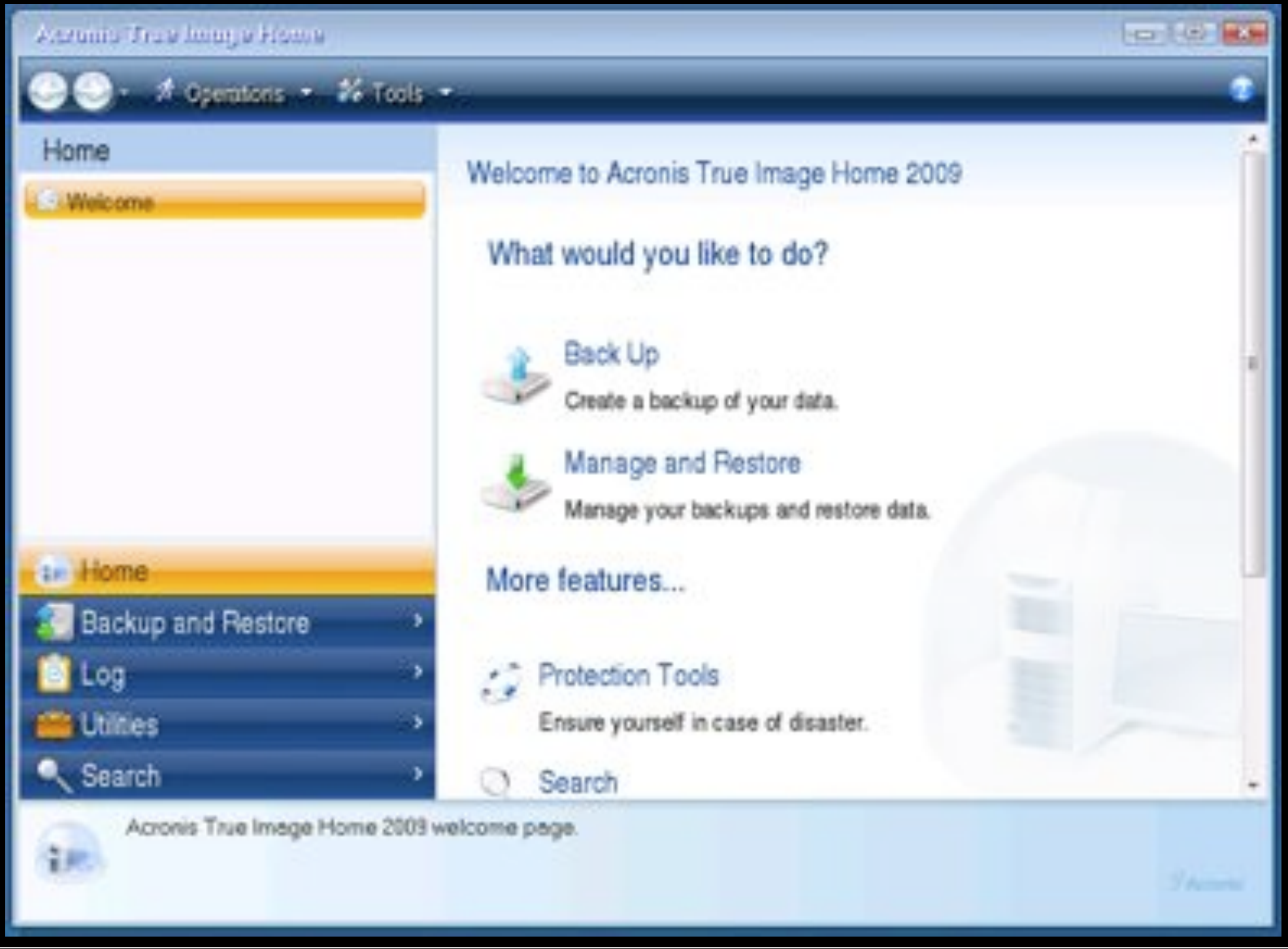
Ghost (corporate) $39
5-1000 licenses

http://www.ghost.com

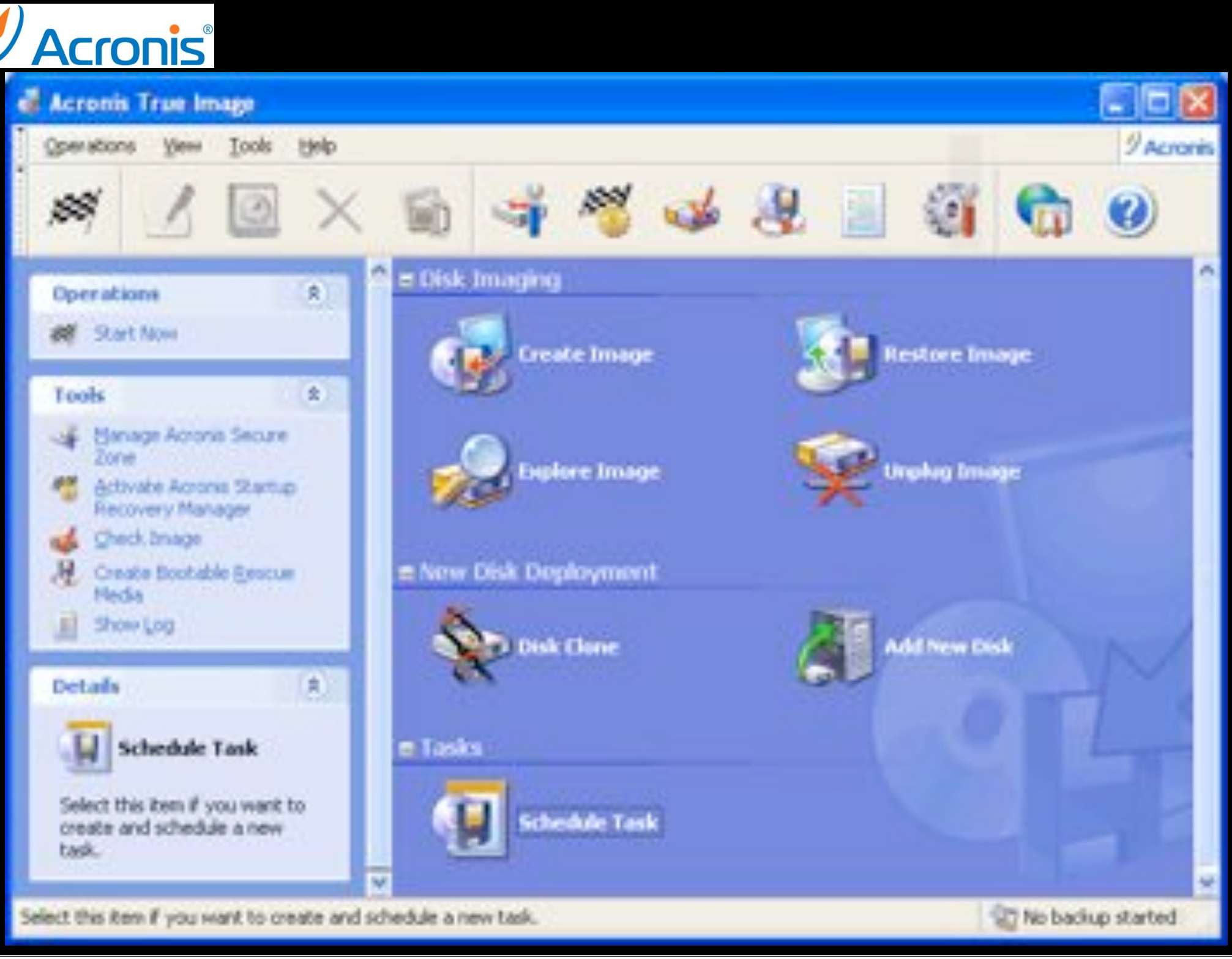
Acronis®

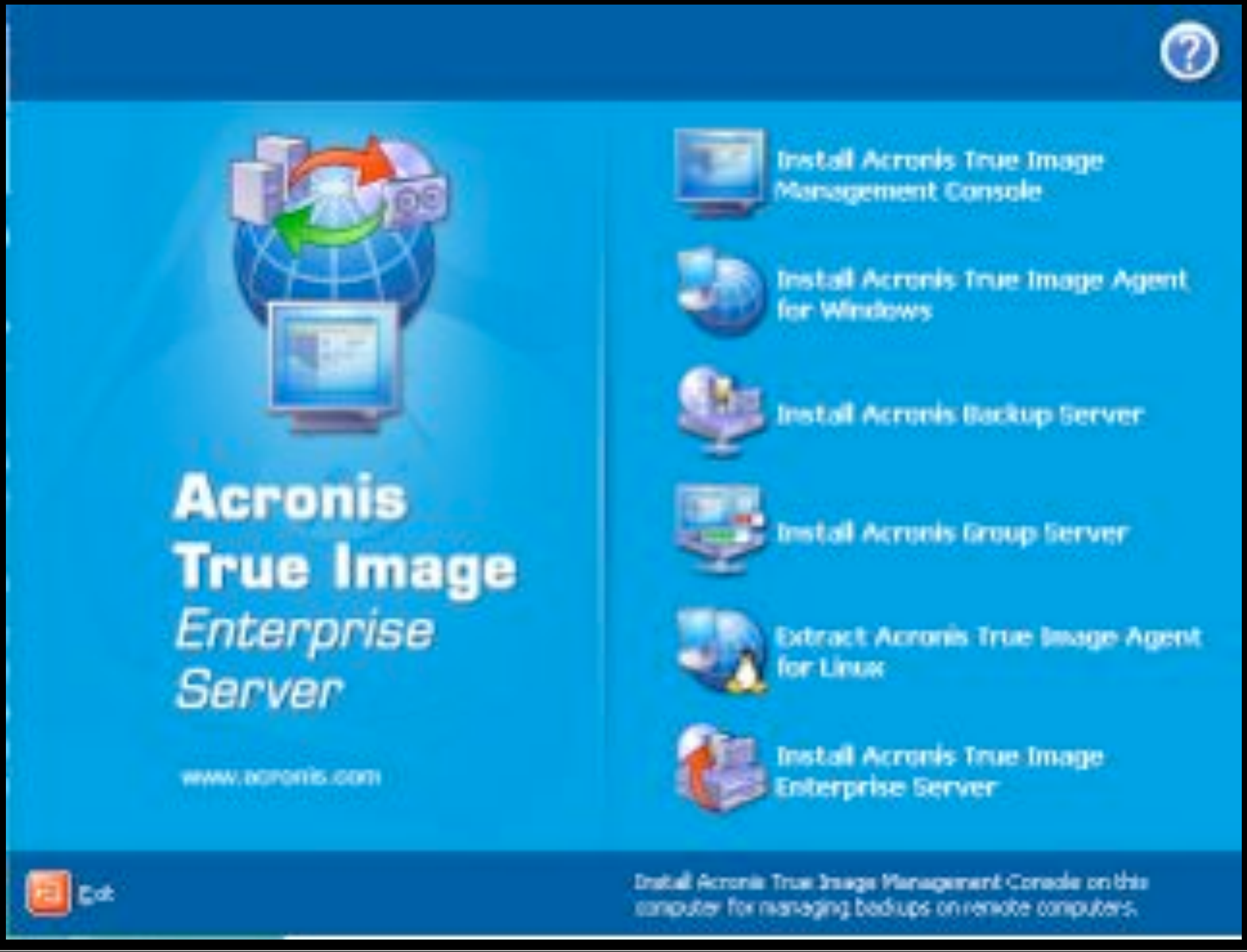
Acronis True Image




Acronis True Image Home
Operations
Tools
Home
Welcome
Welcome to Acronis True Image Home 2009
What would you like to do?
Back Up
Create a backup of your data.
Manage and Restore
Manage your backups and restore data.
More features...
Protection Tools
Ensure yourself in case of disaster.
Search
Home
Backup and Restore
Log
Utilities
Search
Acronis True Image Home 2009 welcome page.

Acronis True Image Trial
Operations View Tools Help
Acronis
Tools
Manage Acronis Secure Zone
Activate Acronis Startup Recovery Manager
Check Archive
Manage System Restore
Create Bootable Rescue Media
Show Log
Help
Help
Web Support
Pick a Task
Backup
Back up your files, folders or the entire hard disk
Recovery
Recover the entire hard disk contents or restore individual files
Clone Disk
Clone your hard disk drive by copying partitions to another hard disk
Add New Disk
Add a new hard disk drive to your PC
or Pick a Tool
Plug Image
Unplug Image
Check Archive
Show Log
Manage Acronis Secure Zone
Activate Acronis Startup Recovery Manager
Active Tasks
No items to display
No Operation started


Acronis
Acronis True Image
Operations
View
Tools
Help
Acronis
Operations
Start Now
Tools
Manage Acronis Secure Zone
Activate Acronis Startup Recovery Manager
Check Image
Create Bootable Rescue Media
Show Log
Details
Schedule Task
Select this item if you want to create and schedule a new task.
Disk Imaging
Create Image
Restore Image
Explore Image
Unplug Image
New Disk Deployment
Disk Clone
Add New Disk
Tasks
Schedule Task
Select this item if you want to create and schedule a new task.
No backup started


Acronis
True Image
Enterprise
Server
www.acronis.com
Install Acronis True Image Management Console
Install Acronis True Image Agent for Windows
Install Acronis Backup Server
Install Acronis Group Server
Extract Acronis True Image Agent for Linux
Install Acronis True Image Enterprise Server
Exit
Install Acronis True Image Management Console on this computer for managing backups on remote computers.

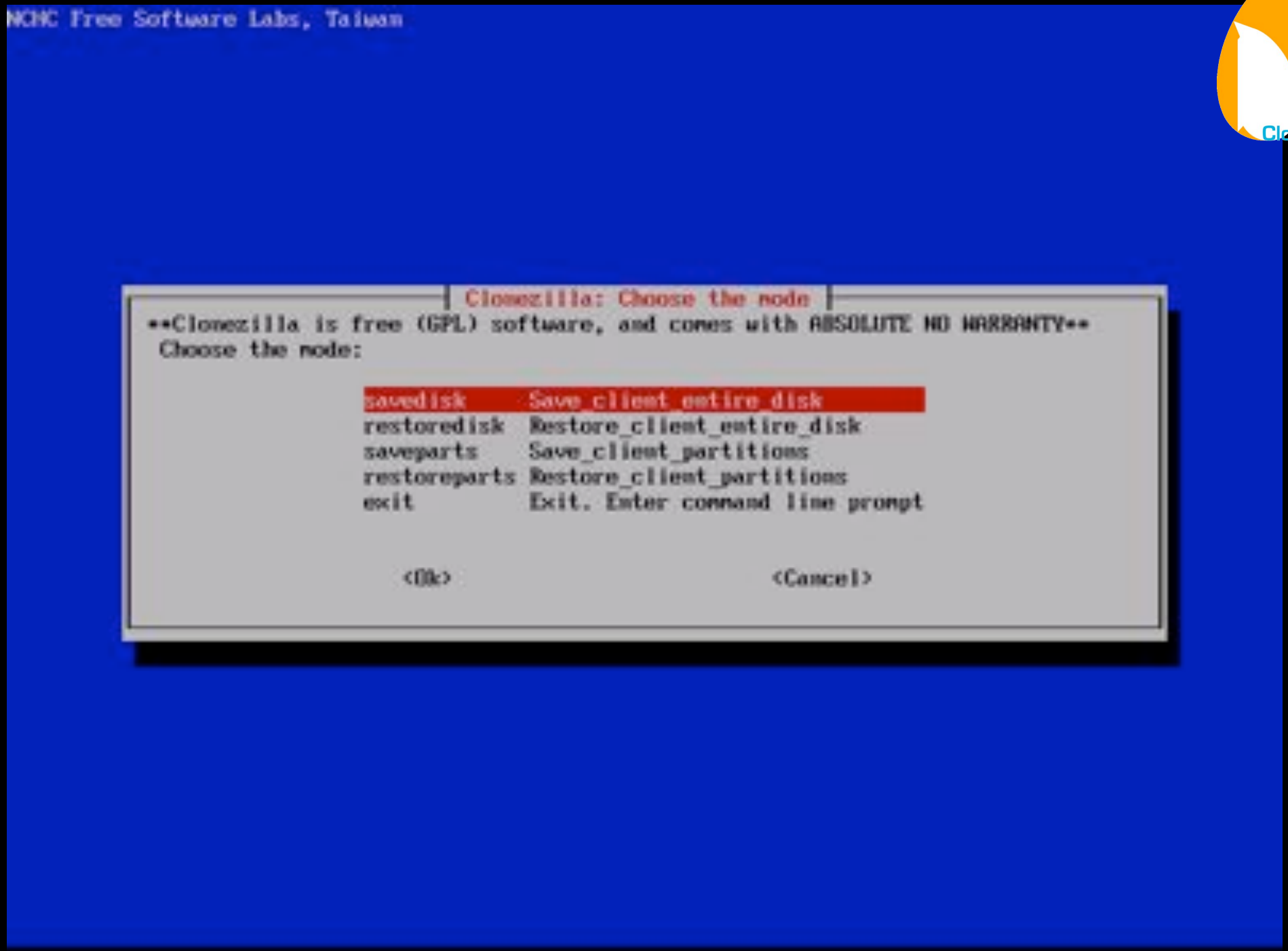
$50 for Home

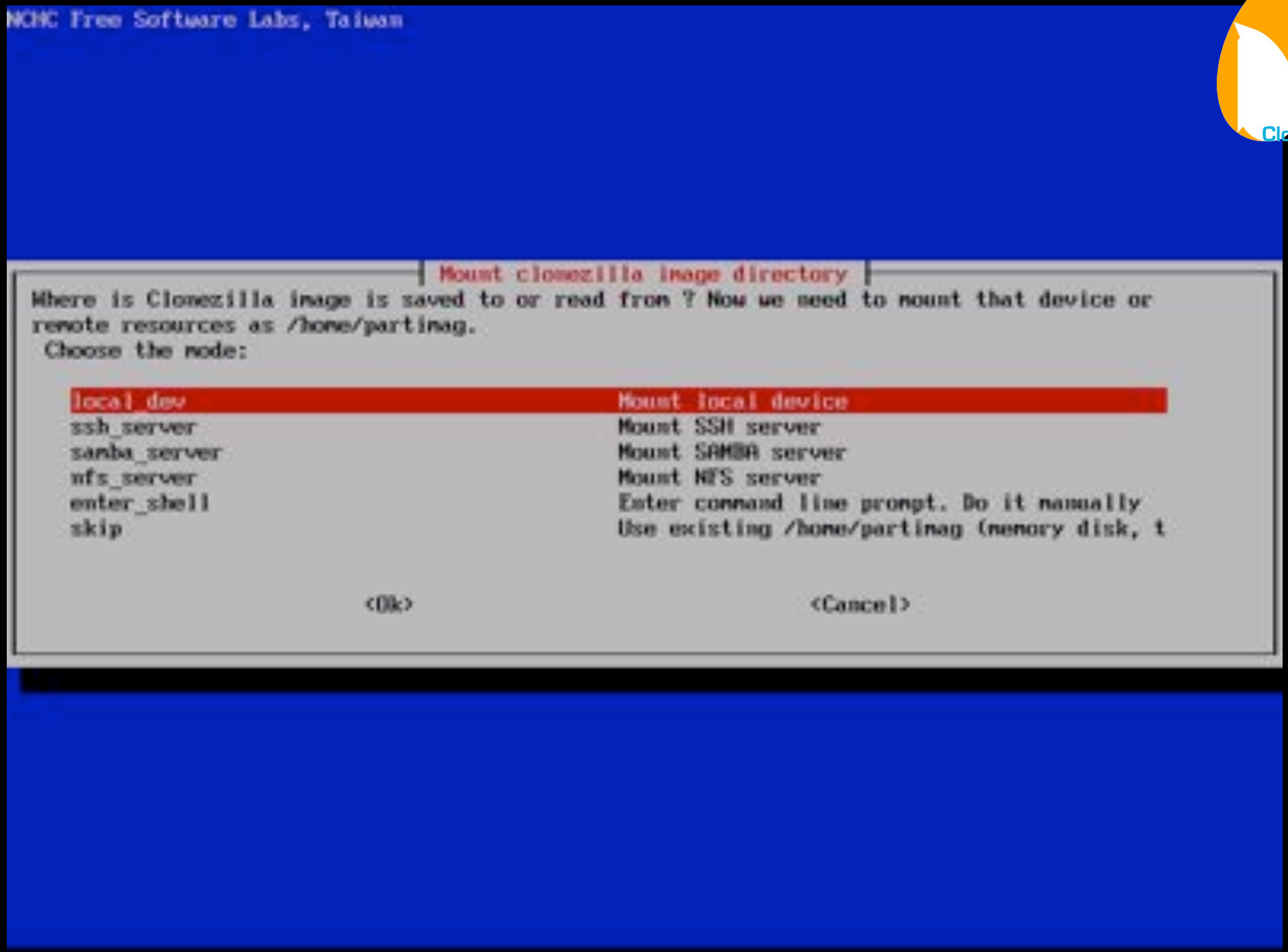
$83 for Workstation

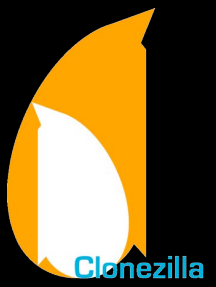
$853 for Server

etc.

Clonezilla

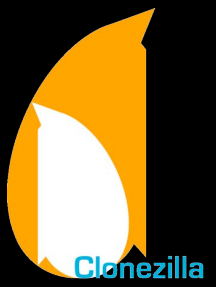

NCHC Free Software Labs, Taiwan
Clonezilla
Clonezilla: Choose the node
Clonezilla is free (GPL) software, and comes with ABSOLUTE NO WARRANTY
Choose the node:
savedisk Save_client_entire_disk
restoredisk Restore_client_entire_disk
saveparts Save_client_partitions
restoreparts Restore_client_partitions
exit Exit. Enter command line prompt
<Ok>
<Cancel>


NCHC Free Software Labs, Taiwan
Clonezilla
Mount clonezilla image directory
Where is Clonezilla image is saved to or read from ? Now we need to mount that device or
remote resources as /home/partimag.
Choose the mode:
local_dev
Mount local device
ssh_server
Mount SSH server
samba_server
Mount SAMBA server
nfs_server
Mount NFS server
enter_shell
Enter command line prompt. Do it manually
skip
Use existing /home/partimag (memory disk, t
<Ok>
<Cancel>



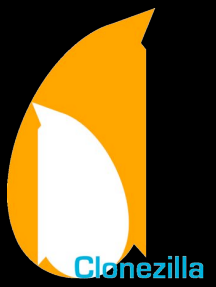
Free & open source

http://clonezilla.org



Filesystems

- ✓ ext2
- ✓ ext3
- ✓ ReiserFS
- ✓ XFS
- ✓ JFS
- ✓ FAT
- ✓ NTFS
- ✓ HFS+



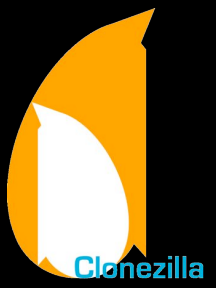
Data saved to:

✓ Local storage

✓ SSH server

✓ Samba Server

✓ NFS share



Clonezilla Live

✓ Single machine backup & restore

Clonezilla SE (Server Edition)

✓ Massive deployment

✓ Clone 40+ PCs simultaneously
(5.6 GB image to 41 PCs
in 10 minutes)

Others

FOG
+ a free computer cloning solution +

FOG
(Free Open-Source Ghost)

http://fogproject.org

http://en.wikipedia.org/wiki/
List_of_disk_cloning_software

Methods, Media, & Models

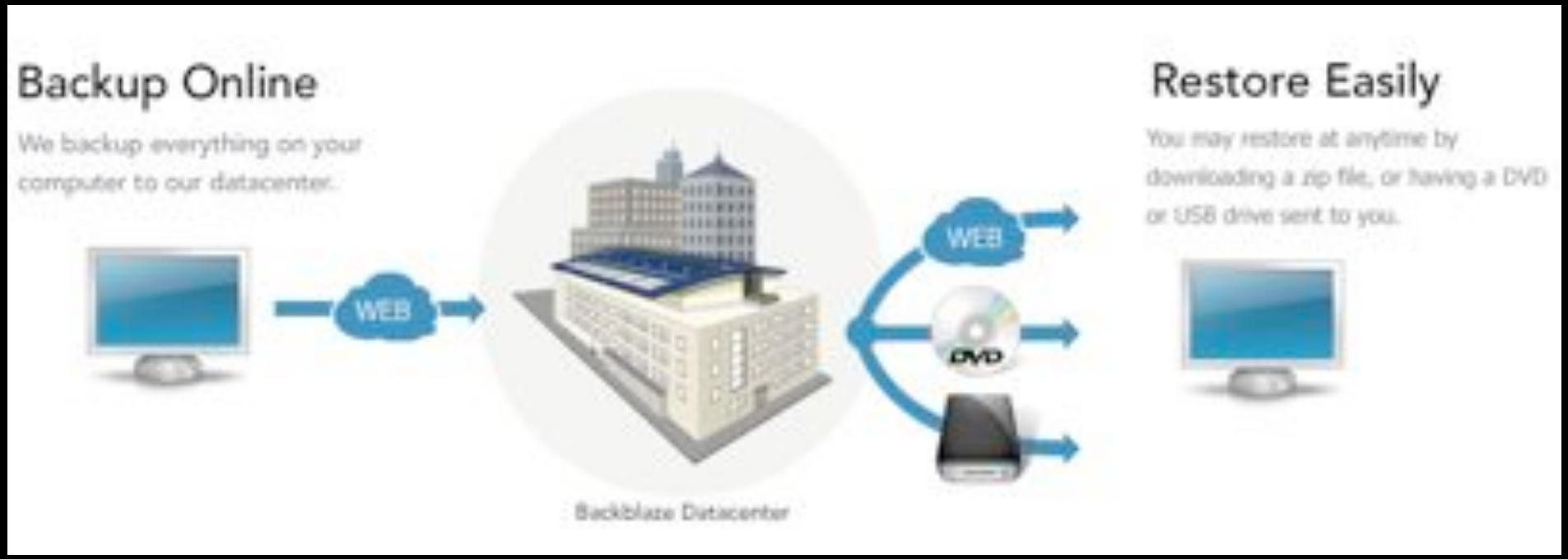
Media

No.

No.

No.

Yes!


Backup Online
We backup everything on your computer to our datacenter.
WEB
Backblaze Datacenter
WEB
DVD
Restore Easily
You may restore at anytime by downloading a zip file, or having a DVD or USB drive sent to you.

Models

Unstructured

✓ Stack of disks or media
✓ Minimal info about
what was backed up, when
✓ Easiest to implement
✓ Least likely for recoverability

Full + Incremental

✓ Full backup,
followed by incremental backups
✓ Restoration complicated:
full backup + increments
to given time
✓ Very common method

Continuous

- ✓ Every change logged & backed up
- ✓ Bytes or blocks saved, not files

Final Thoughts

Backup locally & off-site

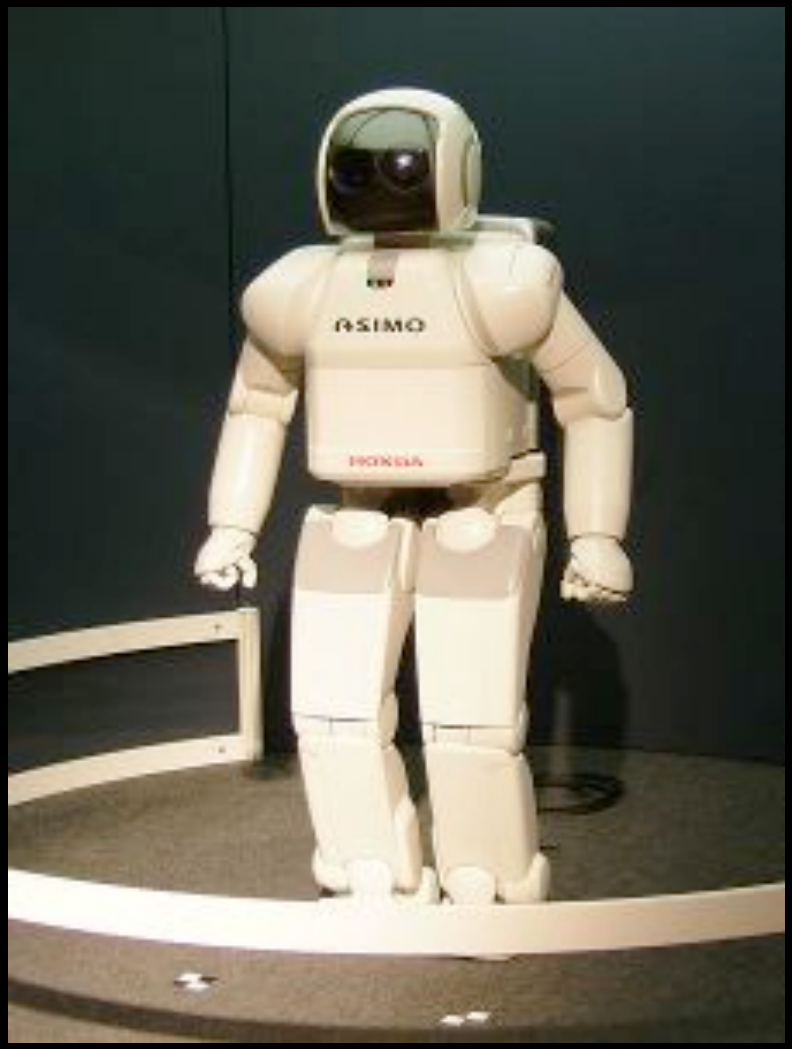
Backup locally & off-site

Backup locally & off-site

Backup locally & off-site

Backup locally & off-site

Automate automate automate



Open formats are better
than closed, proprietary formats

Encrypt sensitive backups

Test your backup!

Thank you!

Email: scott@granneman.com

Web: www.granneman.com

Publications: www.granneman.com/pubs

Blog: blog.granneman.com

Twitter: @scottgranneman

Laugh When Disaster Strikes

Backup Methods & Procedures

Washington University in St. Louis

R. Scott Granneman

scott@granneman.com
www.granneman.com

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Questions? Email scott@granneman.com