

Instruction for backup

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There are two procedures for the backup:

1. Synchronizing your files and directories from the server to your local computer;
2. Synchronizing your files and directories from your local computer to your external hard drive.

These two procedures are introduced in detail as follows.

I. **Synchronizing your files and directories from the server to your local computer**

During this procedure, *rsync* and *crontab* are needed. Here is a brief introduction of them.

- **Introduction of rsync**

rsync is a software application and network protocol for Unix-like and Windows systems that synchronizes files and directories from one location to another while minimizing data transfer using delta encoding when appropriate.

In the backup procedure, *rsync* is used to synchronize your files and directories from the server to your local computer.

- **Introduction of crontab**

A cron is a utility that allows tasks to automatically run in the background of the system at regular intervals by use of the cron daemon. Crontab (CRON TABLE) is a file, which contains the schedule of cron entries to be run, and at what times they are to be run.

In the backup procedure, *crontab* is quite useful, which helps you do the backup once a day without manual operation.

After these brief introductions, I present a workflow for the first procedure as follows,

- 1. Make a directory in your local computer for backup**

e.g. `mkdir ~/backup`

- 2. Copy the *rsync* script to your backup directory**

You can download the script called [backupsript.py](http://sepwww.stanford.edu/data/media/public/sep/yishen/backupscript.py) from

<http://sepwww.stanford.edu/data/media/public/sep/yishen/backupscript.py>

- 3. Change the script**

There are two major parts that needs to be changed in the script *backupsript.py*. These two parts are circled in the following figure.

```
#!/usr/bin/env python

import commands,re,string,sys,os
import datetime
import sys

# Folder on mac where to backup to
backup_on_mac1 = '/Users/yishen/backup/home'
backup_on_mac2 = '/Users/yishen/backup/personal_device'
backup_on_mac3 = '/Users/yishen/backup/web'

# List of folders (on the sever) to backup
folders1=['~/']
folders2=['/yishen']
folders3=['/web/html/data/media/public/sep/yishen']

## Get time and date as string
C=str(datetime.date.today().isoformat())
print C

for folder in folders1:
    cmd = "rsync -bHlpgotrve ssh vostok:" + folder + " " + backup_on_mac1
    print cmd
    os.system(cmd)
    print "done: "+ folder

for folder in folders2:
    cmd = "rsync -bHlpgotrve ssh vostok:" + folder + " " + backup_on_mac2
    print cmd
    os.system(cmd)
    print "done: "+ folder

for folder in folders3:
    cmd = "rsync -bHlpgotrve ssh zapad:" + folder + " " + backup_on_mac3
    print cmd
    os.system(cmd)
    print "done: "+ folder
```

The upper circle means the directory in your local mac that you want to back up to. The lower circle means the directory in the server that you want to back up. In this example, we back up yishen's home directory, personal device and her sep website. You can change them into your desired directory. Don't forget to remove/add the **for** loop in the script if you plan to back up less/more than three directories.

4. Manually run the script

If you want to test whether this script works or not, type the following command in your back up directory.

```
./backupsript.py
```

(Ps: probably you will be asked to connect to the server at your first time.)

5. Create a cron schedule

- Type “crontab -e” in the terminal window
The text editor will open a blank window for the “crontab entries” to be entered. Each line presents a separate cron jobs.

- Put the following line in the window
***** /Users/yishen/backup/backupsript.py restart
An asterisk (*) is used to indicate that every instance (i.e. every hour, every weekday, etc.) of the particular time period will be used.

Here is how positions 1-5 are layed out:

1 Minute 0-59

2 Hour 0-23 (0 = midnight)

3 Day 1-31

4 Month 1-12

5 Weekday 0-6 (0 = Sunday)

- Change asterisks(*) accordingly.
Find you name and the time for you to back up in the following table.
The starting time means your rsync script will automatically run at this particular time.

Then change ***** according to the corresponding format.

For example, Yi Shen’s command would look:

```
40 1 *** /Users/yishen/backup/backupsript.py restart
```

Name	Starting Time	Format
Adam Halpert	00:00 am	0 0 ***
Dave Nichols	00:20 am	20 0 ***
Qiang Fu	00:40 am	40 0 ***
Ohad Barak	01:00 am	0 1 ***
Ali Almomin	01:20 am	20 1 ***
Yi Shen	01:40 am	40 1 ***
Jon Claerbout	02:00 am	0 2 ***
Noha Farghal	02:20 am	20 2 ***
Yang Zhang	02:40 am	40 2 ***
Bob Clapp	03:00 am	0 3 ***
Jason Chang	03:20 am	20 3 ***
Musa Maharramov	03:40 am	40 3 ***

Mandy Wong	04:00 am	0 4 * * *
Chris Leader	04:20 am	20 4 * * *
Sjoerd de Ridder	04:40 am	40 4 * * *
Xukai Shen	05:00 am	0 5 * * *
Elita Li	05:20 am	20 5 * * *
Stew Levin	05:40 am	40 5 * * *
Biondo Biondi	06:00 am	0 6 * * *
Shuki Ronen	06:20 am	20 6 * * *
Antoine Guitton	06:40 am	40 6 * * *

6. [optional] Check the success of your crontab

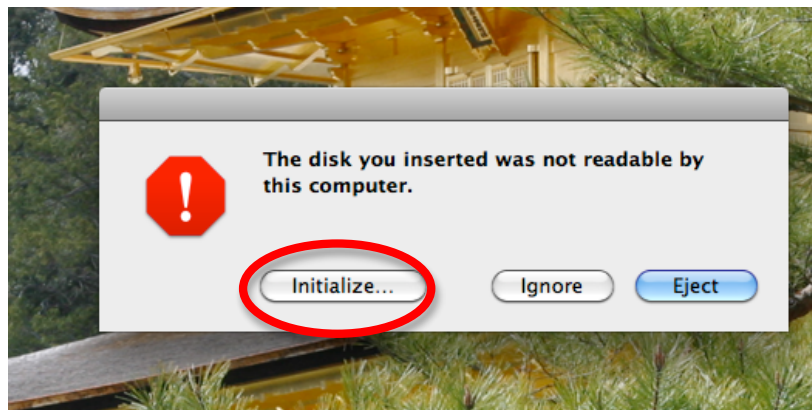
Type "ls -ltr /var/mail", and check the time shown in bold as follows
 -rw----- 1 yishen mail 5559 **Mar 14 14:30** yishen

Notice: The first backup will take a while, which may exceed 20 minutes. Manually running the script for your first backup during the weekend or in the evening instead of using crontab is recommended.

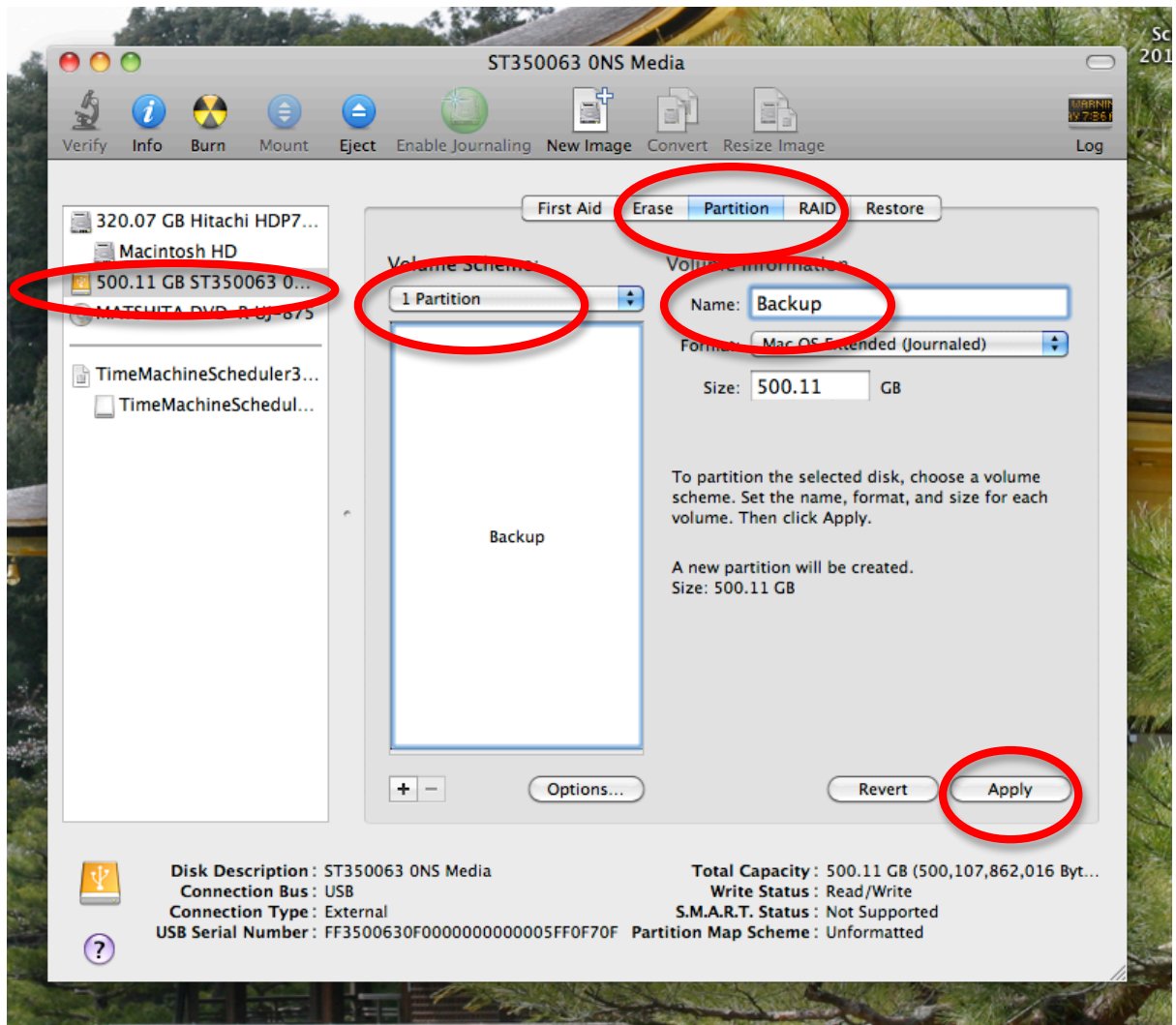
II. Synchronizing your files and directories from your local computer to your external hard drive

First, initialize your hard drive

1. Click **Initialize** in the pop-up window as follows



2. Another window will pop up which is shown as follows. Select a disk which is circled in red.
3. Click **Partition** tab (circled in red);
4. Click **Volume Scheme** to choose how many partitions you need (circled in red);
5. Change the **Name** of your hard disk (circled in red);
6. Click **Apply** (circled in red).



Second, use time machine to back up your local computer

- **Introduction of time machine**

Time Machine is the built-in backup that works with your Mac and an external drive (sold separately) or Time Capsule. Connect the drive, assign it to Time Machine, and start enjoying some peace of mind. Time Machine automatically backs up your entire Mac, including system files, applications, accounts, preferences, music, photos, movies, and documents. But what makes Time Machine different from other backup applications is that it not only keeps a spare copy of every file, it remembers how your system looked on any given day—so you can revisit your Mac as it appeared in the past.

- **How to use time machine**

1. Select **Time Machine** menu > Open **Time Machine Preference**.
2. Click **Select Disk**

3. Choose a drive where backups will be stored, then click **Use Backup Disk**
4. [optional]In Time Machine preferences you can click the **Options** button to select items to exclude from the backup
5. [optional]change the backup interval

- From the command line

If you don't want to install any extra software then you can change Time Machine's backup interval from a shell prompt. Start up a Terminal window and then type:

```
sudo defaults write  
/System/Library/LaunchDaemons/com.apple.backupd-auto  
StartInterval -int 18000
```

The 18000 above is the required backup interval in seconds — five hours in this example. And note that the above command is all on one line.

- Point-and-click

There are several full Mac OS applications out there that allow you to manipulate Time Machine's hidden preferences. The two most popular are Time Machine Scheduler and Time Machine Editor.

6. Restore.

Choose **Enter Time Machine** from the **Time Machine menu** and the restore interface appears. You can literally see your windows as they appeared "back in time."

Notice: The first backup may take a while. You may want to set up Time Machine in the evening so that the initial backup can be done overnight. You should not interrupt the initial backup. You can continue to use your Mac while Time Machine backs up.

Once the initial backup is completed, Time Machine performs subsequent hourly backups of only the files that have changed on your Mac since the last backup (as long as your Mac is awake and the backup drive is connected).

To know more information about time machine, please check the following website:

<http://support.apple.com/kb/HT1427>

If you have any question, feel free to contact Yi Shen:

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