RSYNC FOR NON-EXPERTS

MICHAEL SHARPE

The UNIX program `rsync` provides an exceedingly flexible and efficient tool for copying or synchronizing folders to either the same machine or to a remote machine. Its efficiency derives from the fact that, having examined the source and destination, it transmits only the difference between them. This little explanation covers only a small selection of its properties that I've found most useful, giving a short explanation of the most crucial options and a collection of examples. Briefly, `rsync` copies files from a source into a destination provided (most efficient with option `-u`) the source file is newer or has the same date-time-stamp and a different size. The source may be a folder, the contents of a folder, or a collection of files resulting from, eg, `*.tex`—all `tex` files in the current folder.

Main Options

`-C` blocks copying of files you normally would not wish to transfer, like backup files and the like.
`-a` specifies that copies should be archival, preserving most file attributes—eg, modification time and date as well as permissions and ownerships.
`-u` blocks copying files that are newer on the destination.
`-v` specifies more verbose responses from `rsync`.
`-n` specifies a dry-run, listing what would have been copied.
`-z` says to compress what is transferred.
`--delete` removes files in destination that are not present in source. This is important for synchronization as opposed to the default "copying into".
`--exclude` blocks matching files in source from being copied, eg, `--exclude '**/.*'` will block all hidden files and folders from being copied.

Copy folder or folder contents?

This distinction is controlled by the presence of a slash at the end of the path to the source folder. Without a slash on the source folder, the folder itself is copied to the destination, otherwise only the folder contents are copied. A slash on the destination folder seems to have no effect on copying behavior.

Copy sourcefolder into destfolder on same machine

```
rsync -Cauvz /Users/msharpe/sourcefolder /Users/msharpe/Desktop/destfolder
```

creates `/Users/msharpe/Desktop/destfolder/sourcefolder` if it does not exist and recursively copies `sourcefolder`'s contents into it.

By contrast,

```
rsync -Cauvz /Users/msharpe/sourcefolder/ /Users/msharpe/Desktop/destfolder
```

recursively copies `sourcefolder`'s contents into `/Users/msharpe/Desktop/destfolder`.

To copy recursively a folder's contents to a flat folder:

```
rsync -lptgou /Users/msharpe/sourcefolder/ /Users/msharpe/Desktop/destfolder
```

Date: December 13, 2013.

The result is that no subfolders will be generated in `destfolder`, but it will contain every file (attributes preserved) within `sourcefolder` and its subfolders at any depth.

Synchronize to another machine on local network

```
rsync -Cauvz --delete ~/sourcefolder msharpe@192.168.0.21:~
```

creates `sourcefolder` in the home folder of the remote machine, if it does not exists, and synchronizes its contents recursively to the contents of the source. (Files on destination that are newer are not replaced.)

Synchronize to a remote machine

```
rsync -Cauvz --delete --exclude '**/.*' ~/sourcefolder msharpe@euclid.ucsd.edu:public_html
```

creates `sourcefolder` in the subdirectory `public_html` of the home folder on the remote machine, if it does not exists, and synchronizes its contents recursively to the contents of the source. (Files on destination that are newer are not replaced.) The remote machine will prompt you for your password.