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# Rsync (Remote Sync): 10 Practical Examples of Rsync Command in Linux

by Tarunika Shrivastava | Published: September 17, 2013 | Last Updated: August 19, 2016

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**Rsync (Remote Sync)** is a most commonly used command for **copying** and **synchronizing** files and directories **remotely** as well as **locally** in **Linux/Unix** systems. With the help of **rsync** command you can copy and synchronize your data remotely and locally across directories, across disks and networks, perform data backups and mirroring between two Linux machines.



# 10 rsync Commands For File Synchronize

*Rsync Local and Remote File Synchronization*

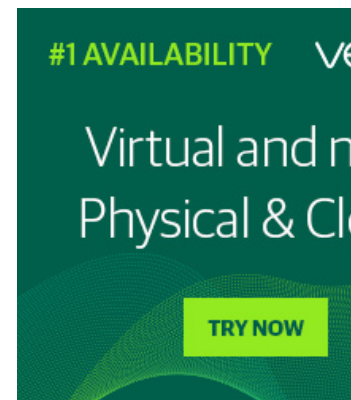
This article explains **10** basic and advanced usage of the **rsync** command to transfer your files remotely and locally in **Linux** based machines. You don't need to be **root** user to run **rsync** command.

## Some advantages and features of Rsync command

- It efficiently copies and sync files to or from a remote system.
- Supports copying links, devices, owners, groups and permissions.
- It's faster than **scp** (Secure Copy) because **rsync** uses remote-update protocol which allows to transfer just the differences between two sets of files. First time, it copies the whole content of a file or a directory from source to destination but from next time, it copies only the changed blocks and bytes to the destination.
- Rsync consumes less **bandwidth** as it uses compression and decompression method while sending and receiving data both ends.

## Basic syntax of rsync command

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```
# rsync options source destination
```

## Some common options used with rsync commands

- **-v** : verbose
- **-r** : copies data recursively (but don't preserve timestamps and permission while transferring data)
- **-a** : archive mode, archive mode allows copying files recursively and it also preserves symbolic links, file permissions, user & group ownerships and timestamps
- **-z** : compress file data
- **-h** : human-readable, output numbers in a human-readable format

**Suggested Read:** [How to Sync Files/Directories Using Rsync with Non-standard SSH Port](#)

## Install rsync in your Linux machine

We can install **rsync** package with the help of following command.

```
# yum install rsync (On Red Hat based systems)
# apt-get install rsync (On Debian based system)
```

## 1. Copy/Sync Files and Directory Locally

### Copy/Sync a File on a Local Computer

This following command will sync a single file on a local machine from one location to another location. Here in this example, a file name **backup.tar** needs to be copied or synced to **/tmp/backups/** folder.

```
[root@tecmint]# rsync -zvh backup.tar /tmp/backups
created directory /tmp/backups
backup.tar
sent 14.71M bytes  received 31 bytes  3.27M byte/s
total size is 16.18M  speedup is 1.10
```

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In above example, you can see that if the destination is not already exists rsync will create a directory automatically for destination.

## Copy/Sync a Directory on Local Computer

The following command will transfer or sync all the files of from one directory to a different directory in the same machine. Here in this example, `/root/rpmpkgs` contains some rpm package files and you want that directory to be copied inside `/tmp/backups/` folder.

```
[root@tecmint]# rsync -avzh /root/rpmpkgs /tmp/
sending incremental file list
rpmpkgs/
rpmpkgs/httpd-2.2.3-82.el5.centos.i386.rpm
rpmpkgs/mod_ssl-2.2.3-82.el5.centos.i386.rpm
rpmpkgs/nagios-3.5.0.tar.gz
rpmpkgs/nagios-plugins-1.4.16.tar.gz
sent 4.99M bytes  received 92 bytes  3.33M byte
total size is 4.99M  speedup is 1.00
```

## 2. Copy/Sync Files and Directory to or From a Server

### Copy a Directory from Local Server to a Remote Server

This command will sync a directory from a local machine to a remote machine. **For example:** There is a folder in your local computer "`rpmpkgs`" which contains some **RPM** packages and you want that local directory's content send to a remote server, you can use following command.

```
[root@tecmint]$ rsync -avz rpmpkgs/ root@192.168.0.101:
root@192.168.0.101's password:
sending incremental file list
./
httpd-2.2.3-82.el5.centos.i386.rpm
mod_ssl-2.2.3-82.el5.centos.i386.rpm
nagios-3.5.0.tar.gz
nagios-plugins-1.4.16.tar.gz
sent 4993369 bytes  received 91 bytes  399476.8
total size is 4991313  speedup is 1.00
```

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## Copy/Sync a Remote Directory to a Local Machine

This command will help you sync a remote directory to a local directory. Here in this example, a directory `/home/tarunika/rmpkgs` which is on a remote server is being copied in your local computer in `/tmp/myrpms`.

```
[root@tecmint]# rsync -avzh root@192.168.0.100:
root@192.168.0.100's password:
receiving incremental file list
created directory /tmp/myrpms
rmpkgs/
rmpkgs/httpd-2.2.3-82.el5.centos.i386.rpm
rmpkgs/mod_ssl-2.2.3-82.el5.centos.i386.rpm
rmpkgs/nagios-3.5.0.tar.gz
rmpkgs/nagios-plugins-1.4.16.tar.gz
sent 91 bytes  received 4.99M bytes  322.16K by
total size is 4.99M  speedup is 1.00
```

## 3. Rsync Over SSH

With rsync, we can use **SSH (Secure Shell)** for data transfer, using **SSH** protocol while transferring our data you can be ensured that your data is being transferred in a secured connection with encryption so that nobody can read your data while it is being transferred over the wire on the internet.

Also when we use rsync we need to provide the **user/root** password to accomplish that particular task, so using **SSH** option will send your logins in an encrypted

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## Copy a File from a Remote Server to a Local Server with SSH

To specify a protocol with **rsync** you need to give **"-e"** option with protocol name you want to use. Here in this example, We will be using **"ssh"** with **"-e"** option and perform data transfer.

```
[root@tecmint]# rsync -avzhe ssh root@192.168.0.
root@192.168.0.100's password:
receiving incremental file list
install.log
```

```
sent 30 bytes  received 8.12K bytes  1.48K byte
total size is 30.74K  speedup is 3.77
```

## Copy a File from a Local Server to a Remote Server with SSH

```
[root@tecmint]# rsync -avzhe ssh backup.tar root@192.168.0.100's password:
sending incremental file list
backup.tar
sent 14.71M bytes  received 31 bytes  1.28M byte
total size is 16.18M  speedup is 1.10
```

**Suggested Read: Use Rsync to Sync New or Changed/Modified Files in Linux**

## 4. Show Progress While Transferring Data with rsync

To show the progress while transferring the data from one machine to a different machine, we can use '**progress**' option for it. It displays the files and the time remaining to complete the transfer.

```
[root@tecmint]# rsync -avzhe ssh --progress /home/ro
root@192.168.0.100's password:
sending incremental file list
created directory /root/rpmpkgs
rpmpkgs/
rpmpkgs/httpd-2.2.3-82.el5.centos.i386.rpm
1.02M 100%    2.72MB/s    0:00:00 (xfer
rpmpkgs/mod_ssl-2.2.3-82.el5.centos.i386.rpm
99.04K 100%  241.19kB/s    0:00:00 (xfer#2,
rpmpkgs/nagios-3.5.0.tar.gz
1.79M 100%    1.56MB/s    0:00:01 (xfer
rpmpkgs/nagios-plugins-1.4.16.tar.gz
2.09M 100%    1.47MB/s    0:00:01 (xfer
sent 4.99M bytes  received 92 bytes  475.56K by
total size is 4.99M  speedup is 1.00
```

## 5. Use of **-include** and **-exclude** Options

These two options allows us to **include** and **exclude** files by specifying parameters with these option helps us to specify those files or directories which you want to

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42



include in your sync and exclude files and folders with you don't want to be transferred.

Here in this example, rsync command will include those files and directory only which starts with 'R' and exclude all other files and directory.

```
[root@tecmint]# rsync -avze ssh --include 'R*'
root@192.168.0.101's password:
receiving incremental file list
created directory /root/rpm
./
Requirename
Requireversion
sent 67 bytes  received 167289 bytes  7438.04 b
total size is 434176  speedup is 2.59
```

## 6. Use of `-delete` Option

If a file or directory not exist at the source, but already exists at the destination, you might want to delete that existing file/directory at the target while syncing .

We can use '`-delete`' option to delete files that are not there in source directory.

Source and target are in sync. Now creating new file **test.txt** at the target.

```
[root@tecmint]# touch test.txt
[root@tecmint]# rsync -avz --delete root@192.16
Password:
receiving file list ... done
deleting test.txt
./
sent 26 bytes  received 390 bytes  48.94 bytes/
total size is 45305958  speedup is 108908.55
```

Target has the new file called **test.txt**, when synchronize with the source with '`-delete`' option, it removed the file **test.txt**.

## 7. Set the Max Size of Files to be Transferred

You can specify the **Max** file size to be transferred or sync. You can do it with "`-max-size`" option. Here in this

example, Max file size is 200k, so this command will transfer only those files which are equal or smaller than 200k.

```
[root@tecmint]# rsync -avzhe ssh --max-size='200k' root@192.168.0.100's password:
sending incremental file list
created directory /root/tmprpm
./
Conflictname
Group
Installtid
Name
Provideversion
Pubkeys
Requireversion
Sha1header
Sigmd5
Triggername
__db.001
sent 189.79K bytes  received 224 bytes  13.10K
total size is 38.08M  speedup is 200.43
```

## 8. Automatically Delete source Files after successful Transfer

Now, suppose you have a main web server and a data backup server, you created a daily backup and synced it with your backup server, now you don't want to keep that local copy of backup in your web server.

So, will you wait for transfer to complete and then delete those local backup file manually? Of Course NO. This automatic deletion can be done using '**--remove-source-files**' option.

```
[root@tecmint]# rsync --remove-source-files -zv backup.tar
sent 14.71M bytes  received 31 bytes  4.20M
total size is 16.18M  speedup is 1.10
[root@tecmint]# ll backup.tar
ls: backup.tar: No such file or directory
```

## 9. Do a Dry Run with rsync

If you are a newbie and using rsync and don't know what exactly your command going to do. Rsync could really mess up the things in your destination folder and then doing an undo can be a tedious job.



### Suggested Read: How to Sync Two Apache Web Servers/Websites Using Rsync

Use of this option will not make any changes only do a dry run of the command and shows the output of the command, if the output shows exactly same you want to do then you can remove '**-dry-run**' option from your command and run on the terminal.

```
root@tecmint]# rsync --dry-run --remove-source-files backup.tar
sent 35 bytes  received 15 bytes  100.00 bytes/s
total size is 16.18M  speedup is 323584.00 (DRY)
```

## 10. Set Bandwidth Limit and Transfer File

You can set the bandwidth limit while transferring data from one machine to another machine with the the help of '**-bwlimit**' option. This options helps us to limit I/O bandwidth.

```
[root@tecmint]# rsync --bwlimit=100 -avzhe ssh root@192.168.0.100's password:
sending incremental file list
sent 324 bytes  received 12 bytes  61.09 bytes/s
total size is 38.08M  speedup is 113347.05
```

Also, by default rsync syncs changed blocks and bytes only, if you want explicitly want to sync whole file then you use '**-W**' option with it.

```
[root@tecmint]# rsync -zvhW backup.tar /tmp/backup/
sent 14.71M bytes  received 31 bytes  3.27M bytes/s
total size is 16.18M  speedup is 1.10
```

That's all with rsync now, you can see **man pages** for more options. Stay connected with **Tecmint** for more exciting and interesting tutorials in future. Do leave your **comments** and **suggestions**.

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**Mashkooor Qadir** @ October 27, 2017 at 4:54 pm

Hello friends,

Can any one tell me how to keep update my backup machine.

The problem is here.

Source to destination synchronization need to be 100% accurate. Actually I have 2 servers that I need to be sync (100% copy of each other). I have tested it in the following way.

rsyncdemo dir on both servers that I need to synchronize that contains further sub folders and files.

Test 1:

```
# rsync -uvr -e ssh /rsyncdemo root@10.0.0.100:/rsyncdemo
```

It copies all data successfully no issues. but problem is that if I delete a file or folder on the source machine it do not delete it from the destination.

Test2:

```
# rsync -uvr --delete -e ssh /rsyncdemo root@10.0.0.100:/rsyncdemo
```

It checks on both servers if I deliberately delete a file from the source. The rsync command check it on destination and copy it back to source machine.

I want to keep the destination machine up to date according to the source machine.

How to block/restrict the rsync no to copy any file or folder from the destination to source.

Thanks in Advance

Reply

**sandeep** @ October 3, 2017 at 12:05 pm

Hi,

I am trying to use the rsync with --delete (step :6). But unable to remove the files in the destination.

Reply

**Raj** @ July 21, 2017 at 2:18 pm

How do I use rsync to copy incremental files from window server to my linux server. Need to use sftp.

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