

## How to resume a large SCP file transfer on Linux

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**Question:** I was downloading a large file using SCP, but the download transfer failed in the middle because my laptop got disconnected from the network. Is there a way to resume the interrupted SCP transfer where I left off, instead of downloading the file all over again?

Originally based on BSD RCP protocol, SCP (Secure copy) is a mechanism that allows you to transfer a file between two end points over a secure SSH connection. However, as a simple secure copy protocol, **SCP does not understand range-request or partial transfer like HTTP does**. As such, popular SCP implementations like the `scp` command line tool cannot resume aborted downloads from lost network connections.

If you want to **resume an interrupted SCP transfer**, you need to rely on other programs which support range requests. One popular such program is `rsync`. Similar to `scp`, `rsync` can also transfer files over SSH.

Suppose you were trying to download a file (`bigdata.tgz`) from a remote host `remotehost.com` using `scp`, but the SCP transfer was stopped in the middle due to a stalled SSH connection. You can use the following `rsync` command to easily resume the stopped transfer. Note that the remote server must have `rsync` installed as well.

```
$ cd /path/to/directory/of/partially_downloaded_file
$ rsync -P -rsh=ssh userid@remotehost.com:bigdata.tgz ./bigdata.tgz
```

The "-P" option is the same as "--partial --progress", allowing `rsync` to work with partially downloaded files. The "-rsh=ssh" option tells `rsync` to use `ssh` as a remote shell.

Once the command is invoked, `rsync` processes on local and remote hosts compare a local file (`./bigdata.tgz`) and a remote file (`userid@remotehost.com:bigdata.tgz`), determine among themselves what portion of the file is not the same, and transfer the discrepancy to either end. In this case, missing bytes in the partially downloaded local file is downloaded from a remote host.

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```
$
$ scp alice@remote:/iso/centos.iso .
alice@remote's password:
centos.iso                               10% 423MB 7.6MB/s 07:47 ETA^
C$
$
$
$
$ rsync -P -rsh=ssh alice@remote:/iso/centos.iso ./centos.iso
alice@remote's password:
receiving incremental file list
centos.iso                               File transfer resumed
          929.99M 23% 6.46MB/s 0:07:59
```

If the above `rsync` session itself gets interrupted, you can resume it as many time as you want by typing the same command. `rsync` will automatically restart the transfer where it left off.