

How to parallelize rsync

GNU parallel can run multiple rsync processes concurrently to transfer files in batches.

Usage

This command:

```
find path/to/src/. -type f -print0 |  
  parallel -0 -j 4 -N 100 --eta rsync -aR {} dest/ &&  
  rsync -avP path/to/src/ dest/
```

is approximately equivalent to:

```
rsync -avP path/to/src/ dest/
```

Options:

- -print0 and -0: Safely handle filenames containing whitespace, including newlines.
- -j 4: Run up to four concurrent jobs.
- -N 100: Transfer up to 100 files per job.
- --eta: Display progress and estimated completion time.
- rsync -aR: Preserve file attributes and relative directory paths.

Similarly, this command:

```
find path/to/./src -type f -print0 |  
  parallel -0 -j 4 -N 100 --eta rsync -aR {} dest/ &&  
  rsync -avP path/to/src dest/
```

is approximately equivalent to:

```
rsync -avP path/to/src dest/
```

This command:

```
find path/to/src -type f -print0 |  
  parallel -0 -j 4 -N 100 --eta rsync -aR {} dest/ &&  
  rsync -avRP path/to/src dest/
```

is approximately equivalent to:

```
rsync -avRP path/to/src dest/
```

Directory Structure

The position of `/./` determines which path components are preserved by `rsync -R`.

- `path/to/src/.` copies the contents of `src/` directly into `dest/`.
- `path/to/./src` preserves `src/` under `dest/` but removes `path/to/`.
- `/path/to/src/.` copies the contents of `src/` directly into `dest/`.
- `/path/to/./src` preserves `src/` under `dest/` but removes `/path/to/`.

For absolute paths, explicitly position `/./` to preserve only the intended directory structure. Without `/./`, `rsync -R` preserves additional leading path components.

Limitations

- Only regular files are transferred; symbolic links and empty directories are excluded.
- Directory metadata may not be fully preserved.
- Progress is measured by completed batches, not bytes.
- Parallel transfers may be slower on I/O-constrained systems.
- `-del` is not supported directly by this approach.

The final `rsync` pass handles symbolic links, empty directories, directory metadata, and any remaining file differences. The `&&` operator ensures that it runs only if GNU parallel succeeds. Add `-del` to the final `rsync` command to remove extraneous destination files.

References

- [GNU Parallel](#)
- [rsync](#)

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