

05 – Archiving

CS 2043: Unix Tools and Scripting, Spring 2019 [1]

Matthew Milano

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Cornell University

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File Compression

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Package and Compress (Archive) Files

`zip <name_of_archive> <files_to_include>`

- E.g. `zip files.zip a.txt b.txt c.txt`
- Extracts to `a.txt`, `b.txt`, and `c.txt` in *current directory*.
- To do folders, you need recursion.
 - `zip -r folder.zip my_files/`
 - Extracts to folder named `my_files` in *current directory*.
 - Good practice to ALWAYS zip a folder and distribute with the name it will extract as.
 - `zip -r folder_name.zip folder_name/`
 - Drives me *crazy* when I get a `.zip` that extracts files in the same directory... very difficult to keep track of.

List, Test and Extract Compressed Files in a **zip** Archive

`unzip <archive_name>`

- Use `-l` to list what would extract before doing it.
- **Note:** The original files DO stay intact.

Making Archives: Gzip

GNU zip

```
gzip <files_to_compress>
```

- Less time to compress, larger file: - -**fast**
- More time to compress, smaller file: - -**best**
- Read the **man** page, lots of options.
- By default, *replaces* the original files!
 - You can use - -**keep** to bypass this.

GNU unzip

```
gunzip <archive_name>
```

- Use -**l** to list what would extract before doing it.

• Notes:

- Does not bundle the files.
- Reiterate: *replaces original* by default.
- Usually has better compression than **zip**.

Additional Archive Formats

- This is a non-exhaustive list. There are **many** out there.
- Similar interface to **gzip**:
 - **bzip2**: “Burrows-Wheeler block sorting compression algorithm”
 - **xz**: “x”-zip, uses LZMA compression scheme (good)
- Honorable mentions:
 - **file.rar**: a “**RAR**” archive; used for distributing large files
 - **file.rar.001**, **file.rar.002**, etc: multiple archives needed to reconstruct whole.
 - You extract the first one, it looks for the others in same directory.
 - **file.7z**: “**7**”-zip, successor to RAR, uses LZMA
 - If you are choosing between **.rar** and **.7z**...choose **.7z**.
 - Install **unrar** to deal with these on Unix.
- **Moral**:
 - Working with **tar** and/or only Unix? **Use xz**.
 - Have to support Windows fools? **Use 7zip**.

Making Archives: Tar

- Bundling files together to compress is easy!

Tape archive

```
tar -cf <tar_archive_name> <files_to_compress>
```

- Create a tar archive.

```
tar -xf <tar_archive_name>
```

- Extract all files from archive.

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- **tar** is a stream tool. By default, it is expecting stream input.
 - Don't forget the **-f** if you are working with files!

• Notes:

- **tar** is just a bundling suite, creating a single file.
- By default, it does *not* compress.
- Original files DO stay intact.
- Unlike **zip**, you do not need the **-r** flag for folders :)

Making Archives: Tarballs

Making tarballs

```
tar -c[zjJ]f <archive_name> <source_files>
```

```
tar -x[zjJ]f <archive_name>
```

- [zjJ] here means *either z, j, or J* — only one.
- YOU have to specify the file extension.
- Use **gzip** compression method: -z (or --gzip)
 - Extension convention: **.tar.gz**
 - Example: **tar -czf files.tar.gz files/**
- Use **bzip2** compression method: -j (or --bzip2)
 - Extension convention: **.tar.bz2**
 - Example: **tar -cjf files.tar.bz2 files/**
- Use **xz** compression method: -J (or --xz)
 - Extension convention: **.tar.xz**
 - Example: **tar -cJf files.tar.xz files/**

Pro Tip: Minimize your Keystrokes

- **Extraction** can *usually* happen automatically:
 - `tar -xf files.tar.gz` will usually work (no `-z`)
 - Best results when:
 - You are obeying filename conventions.
 - `tar` made the archive in the first place.
- **Compression**: no, you have to tell it what to do...
- **SUDDEN REMINDER** to obsessively hit your **tab** key ;)

References

- [1] Stephen McDowell, Bruno Abrahao, Hussam Abu-Libdeh, Nicolas Savva, David Slater, and others over the years. “Previous Cornell CS 2043 Course Slides”.