**Archiving and Compression**

**(COMBINE MULTIPLE FILES IN ONE FILE)**

* **Archiving is the process of combining multiple files and directories (same or different sizes) into one file.**
* **On the other hand ,compression is the process of reducing the size of file or directory**
* **Archiving is usually used as a part of a system backup or when moving data from one system to another.**
* **One of the oldest and most common command for creating and working with backup archive “ tar ” command.**
* **With “ tar “ command users can gather large amount of data into single unit known as archive.**
* **What is tar ?**

**Tar stands for Tape Archiving , is used to create archive and extract archive files. In linux , it is one of the essential commands which facilitate archiving functionality. We can use this command for creating uncompressed and compressed archive files and modify and maintain them as well.**

* **Difference between archiving and compression ?**
* **tar <- options> <tar file name>.tar <file to be compressed>**
* **-c :-create an archive**
* **-f :- file name (compulsory option)**
* **-v :- verbose or view**
* **-t :- list the content from archive**
* **-x :- execute the content from archive.**
* **-P :- Preserve permission when extracting file or directory.**
* **-C :- copy content from an archive to another directory.**
* **du -sh /etc :- disk usage or size of file /directory.**
* **tar -cvf /backup.tar /etc :- archive directory combine in backup.tar.(create tar file)**
* **Du -sh /backup.tar :- To show backup file size.(tar file size)**
* **Tar – tvf /backup.tar :- for listing ( to see files in tar )**
* **Tar -xvf /backup.tar -C <path file whwre we want to extract > :- to extract file .**
* **du & df (disk usage & disk free) :- du allow a user to gain disk usage information quickly. The result of the command du doesn’t include the size of deleting file. But impact of the command df for deleting file size due to its disk space is not released immediately.**
* **Unzip :- extract and view content of compressed files.**
* **Zip :- used to compress file size and also used as file package utility.**

**COMPRESSION**

**(TO REDUCE SIZE )**

**Compression is a reduction in the number of bits needed to represent data capacity, speedup file transfer. And decrease cost for storage hardware and network bandwidth.**

1. **Gzip(z) => gzip is a good option for compressing a lot of data as it is quick. It’s memory usage is also low .gzip compression can be used by using “ -z ” option in tar command or by using gzip command. gzip compressed file can be extracted using gunzip.**

**Gzip > file size reduce > normal process > normal time required > it can reduce less file size.**

**Extension :- “ .gz “**

1. **bzip2 ( j ) :- bzip2 provide better compression ratio compared to gzip but require more “CPU Time” to accomplish it. “ -j ” option in tar or bzip2 command can be used for bzip2 comparison . Bunzip is command to extract bzip2 compressed file.**

**bzip2 > reduce file size > medium processing speed > minimum time required > it can reduce max file size**

**extension <file name> .bz2**

1. **xz :- xz use LZMA algorithm which provide impressive compression but in cost of very high cpu and memory**

**usage.**

**Decompression speed is better but it also consumes a lot of memory. Xz compression can be done by “ -j ” option in tar or xz command .**

* **xz > file size reduce > high processing time > maximum time required > it can reduce high file size .**
* **Extension :- <file name> .xz**

**Eg1) tar -czvf /<path where we want to create file >/<filename>.tar.gz /<directory or file name to compress> :- to compress directory / file using gzip.**

* **Du -sh /path (12 M )**

**To check size of file compressed .**

* **tar – xzvf /path where compressed file is -C /path to extract.**

**Eg.2) tar -cjvf </path/tar file name> .tar.bz2 / file to compress :- to compress using bzip2.**

**Du -sh /path ( 11M )**

**Tar -xjvf /path /filename.tat.bz2 -C /path to extract.**

**Eg.3) tar -cJvf </path/tar file name> .tar.xz / file to compress :- to compress using xz.**

**Du -sh /path ( 8.3M )**

**Tar -xJvf /path /filename.tar.xz -C /path to extract.**

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| **No** | **Name** | **Options** | **Extension** | **Unzip** |
| **1** | **gzip** | **-z** | **.tar.gz** | **gunzip** |
| **2** | **bzip2** | **-j** | **.tar.bz2** | **bunzip2** |
| **3** | **xz** | **-J** | **.tar.xz** | **unxz** |

**Separate tools (for already created tar file)**

1. **gzip /etc.tar :- compressed**

**gunzip :- to extract**

1. **bzip2 :- compressed.**

**Bunzip2 :- to extract**

1. **xz :- compressed**

**unxz :- to extract**