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IntroductiontoLinuxAssignment#2.

1. InvestigatingaCompromisedSystem.

Directorieslikelytocontainmodifiedconfigs,maliciousbinaries,andlogs:

-/etc:Systemconfigurationfiles(e.g.,/etc/passwd,/etc/shadow).Anattackermightmodifyfor persistence (e.g., add users). Evidence: Altered timestamps or unauthorized changes.

-/bin:Essentialbinaries(e.g.,ls,cp).Anattackermightreplacethemwithtrojansforbackdoors. Evidence: Unexpected file sizes or hashes.

-/var:Logfiles(e.g.,/var/log/auth.log). Anattackermightdeletelogstohide anintrusion.Evidence: Missing entries or unusual access.

Reasoningfor all:

- /bin:Essentialbinaries;attackersreplaceformaliciousexecution.

- /etc:Configfiles;attackersmodifyforprivilegeescalation.

- /var:Variabledatalikelogs;attackerseraseevidence.

- /usr:Secondarybinaries(/usr/bin);similarto/bin,attackerstargetfornon-essentialtools.

- /tmp:Temporaryfiles;attackersuseforstagingmalware,asit'swritable.

- /opt:Add-onsoftware;attackershidecustomtoolshere.

- /boot:Bootfiles(kernel);attackersmodifyforrootkits.

- /home:Userhomes;attackerstargetforuser-levelpersistence(e.g.,.sshkeys).

```
(Jacques@Jacques) - [~]
$ cd /

(Jacques@Jacques) - [/]
$ ls
bin          home          lib32         opt          srv          vmlinuz
boot         init          lib64         proc         sys          vmlinuz.old
dev          initrd._      lost+found    root         tmp          wslAacBcB
etc          initrd.img.old media          run          usr          wslAEHGhB
holehe-env  lib          mnt          sbin         var          wslAKpnjf

(Jacques@Jacques) - [/]
$ |
```

2. Create the Exact Structure

mkdir -p

~/projects/{client_work/{web/{frontend,backend,database},mobile/{ios,android}},personal/{experiments,archive},shared/{templates,resources}}

```
(Jacques@Jacques) - [~]
$ mkdir -p ~/projects/{client_work/{web/{frontend,backend,database},mobile/{ios,android}},personal/{experiments,archive},shared/{templates,resources}}
(Jacques@Jacques) - [~]
$ tree projects/
projects/
├── client_work
│   ├── mobile
│   │   ├── android
│   │   └── ios
│   └── web
│       ├── backend
│       ├── database
│       └── frontend
├── personal
│   ├── archive
│   └── experiments
└── shared
    ├── resources
    └── templates
15 directories, 0 files
```

3. Navigate Without Absolute Paths

```
(Jacques@Jacques) - [~]
$ cd projects/client_work/web/frontend/

(Jacques@Jacques) - [~/projects/client_work/web/frontend]
$ pwd
/home/vegas/projects/client_work/web/frontend

(Jacques@Jacques) - [~/projects/client_work/web/frontend]
$
```

1. cd ../../../../personal/experiments

pwd

```
(Jacques@Jacques) - [~/projects/client_work/web/frontend]
$ cd ../../../../personal/experiments

(Jacques@Jacques) - [~/projects/personal/experiments]
$ pwd
/home/vegas/projects/personal/experiments

(Jacques@Jacques) - [~/projects/personal/experiments]
$
```

2. cd ../../shared/templates

pwd

```

(Jacques@Jacques)-[~/projects/personal/experiments]
$ cd ../../shared/templates

(Jacques@Jacques)-[~/projects/shared/templates]
$ pwd
/home/vegas/projects/shared/templates

(Jacques@Jacques)-[~/projects/shared/templates]
$ |

```

3. cd../../client_work/web/frontend

pwd

```

(Jacques@Jacques)-[~/projects/shared/templates]
$ cd ../../client_work/web/frontend

(Jacques@Jacques)-[~/projects/client_work/web/frontend]
$ pwd
/home/vegas/projects/client_work/web/frontend

(Jacques@Jacques)-[~/projects/client_work/web/frontend]
$

```

4. CreateRealisticWebProjectStructure

mkdir web_project

```

(Jacques@Jacques)-[~]
$ mkdir web_project

(Jacques@Jacques)-[~]

```

touchweb_project/{index,about,contact}.htmlweb_project/page_{001..012}.html

touchweb_project/{main,reset,theme_light,theme_dark,mobile,tablet,desktop,print}.css

touch web_project/{main,util,config,app,helper,setup}_script.js

touchweb_project/{a,b,c,d}{1..5}.{bak,tmp,old,save}

```

(Jacques@Jacques)~[~]
$ touch web_project/{index,about,contact}.html web_project/page_{001..012}.html

(Jacques@Jacques)~[~]
$ ls projects/
client_work  personal  shared

(Jacques@Jacques)~[~]
$ ls web_project/
about.html    index.html    page_002.html  page_004.html  page_006.html  page_008.html  page_010.html  page_012.html
contact.html  page_001.html  page_003.html  page_005.html  page_007.html  page_009.html  page_011.html

(Jacques@Jacques)~[~]
$ touch web_project/{main,reset,theme_light,theme_dark,mobile,tablet,desktop,print}.css

(Jacques@Jacques)~[~]
$ touch web_project/{main,util,config,app,helper,setup}_script.js

(Jacques@Jacques)~[~]
$ touch web_project/{a,b,c,d}{1..5}.{bak,tmp,old,save}

(Jacques@Jacques)~[~]
$

```

lsweb_project/

```

(Jacques@Jacques)~[~]
$ ls web_project/
a1.bak  a3.save  about.html  b3.bak  b5.save  c3.bak  c5.save  d2.save  d5.bak  page_001.html  page_011.html
a1.old  a3.tmp  app_script.js  b3.old  b5.tmp  c3.old  c5.tmp  d2.tmp  d5.old  page_002.html  page_012.html
a1.save  a4.bak  b1.bak  b3.save  c1.bak  c3.save  config_script.js  d3.bak  d5.save  page_003.html  print.css
a1.tmp  a4.old  b1.old  b3.tmp  c1.old  c3.tmp  contact.html  d3.old  d5.tmp  page_004.html  reset.css
a2.bak  a4.save  b1.save  b4.bak  c1.save  c4.bak  d1.bak  d3.save  desktop.css  page_005.html  setup_script.js
a2.old  a4.tmp  b1.tmp  b4.old  c1.tmp  c4.old  d1.old  d3.tmp  helper_script.js  page_006.html  tablet.css
a2.save  a5.bak  b2.bak  b4.save  c2.bak  c4.save  d1.save  d4.bak  index.html  page_007.html  theme_dark.css
a2.tmp  a5.old  b2.old  b4.tmp  c2.old  c4.tmp  d1.tmp  d4.old  main.css  page_008.html  theme_light.css
a3.bak  a5.save  b2.save  b5.bak  c2.save  c5.bak  d2.bak  d4.save  main_script.js  page_009.html  util_script.js
a3.old  a5.tmp  b2.tmp  b5.old  c2.tmp  c5.old  d2.old  d4.tmp  mobile.css  page_010.html

(Jacques@Jacques)~[~]
$

```

5. Use Wildcards for Cluttered Directory

`mv *_[0-9][0-9][0-9].html archive/`

```

(Jacques@Jacques)~[~/web_project]
$ mkdir archive

(Jacques@Jacques)~[~/web_project]
$ mv *_[0-9][0-9][0-9].html archive/

```

`cp !(mobile|tablet).css desktop/`

```

(Jacques@Jacques)~[~/web_project]
$ mkdir desktop

(Jacques@Jacques)~[~/web_project]
$ cp !(mobile|tablet).css desktop/

```


ls ???.*

```
(Jacques@Jacques) - [~/web_project]
$ ls ???.*
ls: cannot access '???.*': No such file or directory
```

ls[b-df-hj-np-tv-xzB-DF-HJ-NP-TV-XZ]*.*

```
(Jacques@Jacques) - [~/web_project]
$ ls [b-df-hj-np-tv-xzB-DF-HJ-NP-TV-XZ]*.*
b1.bak  b2.save  b4.bak  b5.save  c2.bak  c3.save  c5.bak  d1.bak  d2.save  d4.bak  d5.save  mobile.css  theme_light.css
b1.old  b2.tmp   b4.old  b5.tmp   c2.old  c3.tmp   c5.old  d1.old  d2.tmp   d4.old  d5.tmp   print.css   reset.css
b1.save b3.bak  b4.save c1.bak  c2.save c4.bak  c5.save  d1.save d3.bak  d4.save desktop.css helper_script.js setup_script.js
b1.tmp  b3.old  b4.tmp  c1.old  c2.tmp  c4.old  c5.tmp   d1.tmp  d3.old  d4.tmp  helper_script.js setup_script.js
b2.bak  b3.save b5.bak  c1.save c3.bak  c4.save config_script.js d2.bak  d3.save d5.bak  main.css   tablet.css  theme_dark.css
b2.old  b3.tmp  b5.old  c1.tmp  c3.old  c4.tmp  contact.html d2.old  d3.tmp  d5.old  main_script.js theme_dark.css
```

ls*.*

```
(Jacques@Jacques) - [~/web_project]
$ ls *.*
app_script.js  config_script.js  helper_script.js  main_script.js  setup_script.js  util_script.js
```

6. Brace Expansion for File Naming

touch log_2024-{01..03}-{01..31}.txt

touch{web,api,db}_{dev,stg,prod}.conf

touch{A,B,C}{10,11,12}_{input,output}.txt

```
(Jacques@Jacques) - [~/web_project]
$ touch log_2024-{01..03}-{01..31}.txt

(Jacques@Jacques) - [~/web_project]
$ touch {web,api,db}_{dev,stg,prod}.conf

(Jacques@Jacques) - [~/web_project]
$ touch {A,B,C}{10,11,12}_{input,output}.txt

(Jacques@Jacques) - [~/web_project]
$ ls
A10_input.txt  api_prod.conf  b5.save  config_script.js  index.html  log_2024-01-28.txt  log_2024-02-25.txt  log_2024-03-22.txt
A10_output.txt api_stg.conf  b5.tmp   contact.html     log_2024-01-01.txt  log_2024-01-29.txt  log_2024-02-26.txt  log_2024-03-23.txt
A11_input.txt  app_script.js  C10_input.txt d1.bak          log_2024-01-02.txt  log_2024-01-30.txt  log_2024-02-27.txt  log_2024-03-24.txt
A11_output.txt archive        C10_output.txt d1.old         log_2024-01-03.txt  log_2024-01-31.txt  log_2024-02-28.txt  log_2024-03-25.txt
A12_input.txt  B10_input.txt C11_input.txt  d1.save        log_2024-01-04.txt  log_2024-02-01.txt  log_2024-02-29.txt  log_2024-03-26.txt
A12_output.txt B10_output.txt C11_output.txt d1.tmp         log_2024-01-05.txt  log_2024-02-02.txt  log_2024-02-30.txt  log_2024-03-27.txt
a1.bak         B11_input.txt C12_input.txt  d2.bak         log_2024-01-06.txt  log_2024-02-03.txt  log_2024-02-31.txt  log_2024-03-28.txt
a1.old         B11_output.txt C12_output.txt d2.old         log_2024-01-07.txt  log_2024-02-04.txt  log_2024-03-01.txt  log_2024-03-29.txt
a1.save        B12_input.txt  c1.bak         d2.save        log_2024-01-08.txt  log_2024-02-05.txt  log_2024-03-02.txt  log_2024-03-30.txt
a1.tmp         B12_output.txt c1.old         d2.tmp         log_2024-01-09.txt  log_2024-02-06.txt  log_2024-03-03.txt  log_2024-03-31.txt
a2.bak         b1.bak         c1.save        d3.bak         log_2024-01-10.txt  log_2024-02-07.txt  log_2024-03-04.txt  main.css
a2.old         b1.old         c1.tmp         d3.old         log_2024-01-11.txt  log_2024-02-08.txt  log_2024-03-05.txt  main_script.js
a2.save        b1.save        c2.bak         d3.save        log_2024-01-12.txt  log_2024-02-09.txt  log_2024-03-06.txt  mobile.css
a2.tmp         b1.tmp         c2.old         d3.tmp         log_2024-01-13.txt  log_2024-02-10.txt  log_2024-03-07.txt  print.css
a3.bak         b2.bak         c2.save        d4.bak         log_2024-01-14.txt  log_2024-02-11.txt  log_2024-03-08.txt  reset.css
a3.old         b2.old         c2.tmp         d4.old         log_2024-01-15.txt  log_2024-02-12.txt  log_2024-03-09.txt  setup_script.js
a3.save        b2.save        c3.bak         d4.save        log_2024-01-16.txt  log_2024-02-13.txt  log_2024-03-10.txt  tablet.css
a3.tmp         b2.tmp         c3.old         d4.tmp         log_2024-01-17.txt  log_2024-02-14.txt  log_2024-03-11.txt  theme_dark.css
a4.bak         b3.bak         c3.save        d5.bak         log_2024-01-18.txt  log_2024-02-15.txt  log_2024-03-12.txt  theme_light.css
a4.old         b3.old         c3.tmp         d5.old         log_2024-01-19.txt  log_2024-02-16.txt  log_2024-03-13.txt  util_script.js
a4.save        b3.save        c4.bak         d5.save        log_2024-01-20.txt  log_2024-02-17.txt  log_2024-03-14.txt  web_dev.conf
a4.tmp         b3.tmp         c4.old         d5.tmp         log_2024-01-21.txt  log_2024-02-18.txt  log_2024-03-15.txt  web_prod.conf
a5.bak         b4.bak         c4.save        db_dev.conf    log_2024-01-22.txt  log_2024-02-19.txt  log_2024-03-16.txt  web_stg.conf
a5.old         b4.old         c4.tmp         db_prod.conf   log_2024-01-23.txt  log_2024-02-20.txt  log_2024-03-17.txt
a5.save        b4.save        c5.bak         db_stg.conf    log_2024-01-24.txt  log_2024-02-21.txt  log_2024-03-18.txt
a5.tmp         b4.tmp         c5.old         desktop        log_2024-01-25.txt  log_2024-02-22.txt  log_2024-03-19.txt
about.html     b5.bak         c5.save        helper_script.js log_2024-01-26.txt  log_2024-02-23.txt  log_2024-03-20.txt
api_dev.conf   b5.old         c5.tmp         log_2024-01-27.txt  log_2024-02-24.txt  log_2024-03-21.txt
```

ls

7. LineEndings Comparison

```
printf "This is a test\nLine2\nLine3\n" > linux.txt
```

```
printf "This is a test\r\nLine2\r\nLine3\r\n" > windows.txt
```

```
diff linux.txt windows.txt
```

```
cmp linux.txt windows.txt
```

```
comm linux.txt windows.txt
```

```
(Jacques@Jacques)-[~/web_project]
$ printf "This is a test\nLine2\nLine3\n" > linux.txt

(Jacques@Jacques)-[~/web_project]
$ printf "This is a test\r\nLine2\r\nLine3\r\n" > windows.txt

(Jacques@Jacques)-[~/web_project]
$ diff linux.txt windows.txt
1,3c1,3
< This is a test
< Line2
< Line3
---
> This is a test
> Line2
> Line3

(Jacques@Jacques)-[~/web_project]
$ cmp linux.txt windows.txt
linux.txt windows.txt differ: byte 15, line 1

(Jacques@Jacques)-[~/web_project]
$ comm linux.txt windows.txt
This is a test
comm: file 1 is not in sorted order
Line2
Line3
      This is a test
comm: file 2 is not in sorted order
      Line2
      Line3
comm: input is not in sorted order
```

8. SecurityAuditwithFind

mkdir-p test_env/{dir1,dir2,dir3,dir4,dir5}

```
(Jacques@Jacques)-[~/web_project]
$ mkdir -p test_env/{dir1,dir2,dir3,dir4,dir5}

(Jacques@Jacques)-[~/web_project]
$ |
```

touch test_env/dir1/file{1..5}

```
(Jacques@Jacques)-[~/web_project]
$ touch test_env/dir1/file{1..5}

(Jacques@Jacques)-[~/web_project]
$
```

touch-m -d "2daysago" test_env/dir1/file{1,2}

```
(Jacques@Jacques)-[~/web_project]
$ touch test_env/dir1/file{1..5}

(Jacques@Jacques)-[~/web_project]
$
```

touch-m -d "50daysago" test_env/dir1/file3

```
(Jacques@Jacques)-[~/web_project]
$ touch -m -d "2 days ago" test_env/dir1/file{1,2}

(Jacques@Jacques)-[~/web_project]
$ |
```

touch test_env/dir2/largefile

```
(Jacques@Jacques)-[~/web_project]  
$ touch -m -d "50 days ago" test_env/dir1/file
```

```
(Jacques@Jacques)-[~/web_project]  
$ |
```


ddif=/dev/zeroof=test_env/dir2/largefilebs=1k count=10

```
(Jacques@Jacques)-[~/web_project]
$ sudo chmod 666 test_env/dir5/worldwritable
chmod: cannot access 'test_env/dir5/worldwritable': No such file or directory

(Jacques@Jacques)-[~/web_project]
$ touch test_env/dir5/worldwritable

(Jacques@Jacques)-[~/web_project]
$ sudo chmod 666 test_env/dir5/worldwritable

(Jacques@Jacques)-[~/web_project]
$ |
```

touchtest_env/dir4/.hidden

```
(Jacques@Jacques)-[~/web_project]
$ touch test_env/dir4/.hidden

(Jacques@Jacques)-[~/web_project]
$ |
```

sudochowmnobodytest_env/dir1/file4

```
(Jacques@Jacques)-[~/web_project]
$ sudo chown nobody test_env/dir1/file4
[sudo] password for jacques:

(Jacques@Jacques)-[~/web_project]
$
```

sudochmod666test_env/dir5/worldwritable

```
(Jacques@Jacques)-[~/web_project]
$ sudo chmod 666 test_env/dir5/worldwritable
chmod: cannot access 'test_env/dir5/worldwritable': No such file or directory

(Jacques@Jacques)-[~/web_project]
$ touch test_env/dir5/worldwritable

(Jacques@Jacques)-[~/web_project]
$ sudo chmod 666 test_env/dir5/worldwritable

(Jacques@Jacques)-[~/web_project]
$ |
```

findtest_env -type f -size +\$(findtest_env -type f -printf "%s\n" | awk '{sum+=\$0;n++} END {print int(sum/n)}')c

```
(Jacques@Jacques)-[~/web_project]
$ find test_env -type f -size +$(find test_env -type f -printf "%s\n" | awk '{sum+=$0;n++} END {print int(sum/n)}')c
test_env/dir2/largefile

(Jacques@Jacques)-[~/web_project]
$
```

findtest_env -mtime -3 -mtime +1

```
(Jacques@Jacques)-[~/web_project]
$ find test_env -mtime -3 -mtime +1
test_env/dir1/file1
test_env/dir1/file2
```

```
(Jacques@Jacques)-[~/web_project]
$ |
```

findtest_env -type d -empty -o \(-type d -name "." -not -empty \)

```
(Jacques@Jacques)-[~/web_project]
$ find test_env -type d -empty -o \( -type d -name "." -not -empty \)
test_env/dir3

(Jacques@Jacques)-[~/web_project]
$ |
```

findtest_env -perm /o=w

```
(Jacques@Jacques)-[~/web_project]
$ find test_env -perm /o=w
test_env/dir5/worldwritable
```

```
(Jacques@Jacques)-[~/web_project]
$ |
```

findtest_env -user !\$(whoami) -a -user ! root

```
(vegas@VEGAS)-[~/web_project]
$ find test_env -user ! $(whoami) -a -VEGAS ! root ot
find: invalid user name or UID argument to -user: '!' '!'

(vegas@VEGAS)-[~/web_project]
$ |
(vegas@VEGAS)-[~/web_project]
$ |
```

```
findtest_env-name"*~"-o-name"*.bak"-o-name"*.tmp"
```

```
(Jacques@Jacques)-[~/web_project]
$ find test_env -user ! $(whoami) -a -VEGAS ! root
find: invalid user name or UID argument to -user: '!'

(Jacques@Jacques)-[~/web_project]
$
```

9. AnalyzeLarge Log

```
seq1300> large_log.txt
```

```
(Jacques@Jacques)-[~/web_project]
$ seq 1 300 > large_log.txt

(Jacques@Jacques)-[~/web_project]
$
```

```
sed-n'126,175p'large_log.txt
```

```
(Jacques@Jacques)-[~/web_project]  
$ sed -n '126,175p' large_log.txt
```

```
126  
127  
128  
129  
130  
131  
132  
133  
134  
135  
136  
137  
138  
139  
140  
141  
142  
143  
144  
145  
146  
147  
148  
149  
150  
151  
152  
153  
154  
155  
156  
157  
158  
159  
160  
161  
162  
163  
164  
165  
166  
167  
168  
169  
170  
171  
172  
173  
174  
175
```

```
(Jacques@Jacques)-[~/web_project]
```



```
(Jacques@Jacques) - [~/web_project]
$ grep -n -m1 -B5 "error" large_log.txt | tail -n 6

(Jacques@Jacques) - [~/web_project]
$ |
```

grep-n-m1 -B5"error"large_log.txt| tail-n6

timecatlarge_log.txt>/dev/null

```
(Jacques@Jacques) - [~/web_project]
$ time cat large_log.txt > /dev/null

real    0m0.039s
user    0m0.008s
sys     0m0.029s

(Jacques@Jacques) - [~/web_project]
$ |
```

grep -n "error" large_log.txt

```
(Jacques@Jacques)-[~/web_project]
$ grep -n "error" large_log.txt

(Jacques@Jacques)-[~/web_project]
$ |
```

10. Automate with Find-exec

1. Permissions: `sudo find . -type f -not -perm /a=x -exec chmod 644 {} \;`

```
(Jacques@Jacques)-[~/web_project]
$ sudo find . -type f -not -perm /a=x -exec chmod 644 {} \;

(Jacques@Jacques)-[~/web_project]
$ |
```

`sudo find . -type f -perm /a=x -exec chmod 755 {} \;`

```
(Jacques@Jacques)-[~/web_project]
$ sudo find . -type f -perm /a=x -exec chmod 755 {} \;

(Jacques@Jacques)-[~/web_project]
$ |
```

2. Disk space old files:

`find . -mtime +30 -exec du -c {} + | tail -1`

```
(Jacques@Jacques)-[~/web_project]
$ find . -mtime +30 -exec du -c {} + | tail -1
0          total

(Jacques@Jacques)-[~/web_project]
$ |
```

3. Backup conf:

`find . -name "*.conf" -exec cp {} {}.backup \;`

```
(Jacques@Jacques)-[~/web_project]  
$ find . -name "*.conf" -exec cp {} {}.backup \;
```

```
(Jacques@Jacques)-[~/web_project]  
$ |
```

4. Removetemp:

```
find.-name"*tmp"-atime+7-print.preview)then-execrm{}}\;
```

```
(Jacques@Jacques)~[~/web_project]
$ find . -name "*tmp" -atime +7 -print 'preview' then -exec rm {} \;
find: paths must precede expression: `preview'

(Jacques@Jacques)~[~/web_project]
$ |
```

```
timetarczfcompressed/text.tar.gzcompressed/text du
```

```
-h compressed/text.*
```

```
(Jacques@Jacques)~[~/web_project]
$ mkdir -p compressed/{text,media}

(Jacques@Jacques)~[~/web_project]
$ seq 1 10000 > compressed/text/big_text.txt

(Jacques@Jacques)~[~/web_project]
$ dd if=/dev/urandom of=compressed/media/image.jpg bs=1M count=5
5+0 records in
5+0 records out
5242880 bytes (5.2 MB, 5.0 MiB) copied, 0.134246 s, 39.1 MB/s

(Jacques@Jacques)~[~/web_project]
$ time tar czf compressed/text.tar.gz compressed/text

real    0m0.073s
user    0m0.014s
sys     0m0.056s

(Jacques@Jacques)~[~/web_project]
$ du -h compressed/text.*
24K      compressed/text.tar.gz

(Jacques@Jacques)~[~/web_project]
$ |
```

12. InheritedArchives

```
mkdir-pptest_archive&&touchtest_archive/{file1.txt,file2.conf} tar -
```

```
czf archive.tar.gz test_archive/
```

```
(Jacques@Jacques)~[~/web_project]
$ find . -name "*tmp" -atime +7 -print 'preview' then -exec rm {} \;
find: paths must precede expression: `preview'

(Jacques@Jacques)~[~/web_project]
$ |
```


zip-rarchive.zip.-itest_zip/

```
(Jacques@Jacques)-[~/web_project]
$ zip -r archive.zip . -i test_zip/
zip warning: zip file empty
```

Examine:tar-tfarchive.tar.gz

zip-larchive.zip

Extractpattern:tar-xfarchive.tar.gz--wildcards"*conf"

```
(Jacques@Jacques)-[~/web_project]
$ mkdir -p test_archive && touch test_archive/{file1.txt,file2.conf}

(Jacques@Jacques)-[~/web_project]
$ tar -czf archive.tar.gz test_archive/

(Jacques@Jacques)-[~/web_project]
$ tar -tf archive.tar.gz
test_archive/
test_archive/file2.conf
test_archive/file1.txt
```

Update:tar-ufarchive.tarnewfile

zip -u archive.zip newfile

```
(Jacques@Jacques)-[~/web_project]
$ tar -cf new.tar *
tar: new.tar: archive cannot contain itself; not dumped
```

Corrupted:tar-tfcorrupted.tar

tar-xfarchive1.tar

unzip archive2.zip

tar -cf new.tar *

```
(Jacques@Jacques)-[~/web_project]
$ tar -cf new.tar *
tar: new.tar: archive cannot contain itself; not dumped
```

13. BackupRotation

mkdir-ptest_data&&touchtest_data/file1.txt

```
(Jacques@Jacques)~[~/projects]
$ mkdir -p test_data && touch test_data/file1.txt

(Jacques@Jacques)~[~/projects]
$ tar -cpf backups/daily/inc_$(date +%Y-%m-%d).tar --listed-incremental=backups/snapshot.file test_data/
```

tar-cpfbackups/daily/inc_\$(date+%Y-%m-%d).tar--listed-incremental=snapshot.file/data

tar-cpfbackups/weekly/full_\$(date+%Y-%W).tar--listed-incremental=snapshot.file/data

```
(Jacques@Jacques)~[~/projects]
$ tar -cpf backups/weekly/full_$(date +%Y-%W).tar --listed-incremental=snapshot.file data

(Jacques@Jacques)~[~/projects]
$
```

lsbackups

```
(Jacques@Jacques)~[~/projects]
$ ls backups/
daily  monthly  snapshot.file  weekly  weekly_snapshot.file

(Jacques@Jacques)~[~/projects]
$
```

whoami&&id

```
(Jacques@Jacques)~[~/projects]
$ whoami && id

Jacques
uid=1000(vegas) gid=1000(Jacques) groups=1000(Jacques),4(adm),24(cdrom),27(sudo),30(dip),46(plugdev),100(users)
```

cat/etc/passwd

```
(Jacques@Jacques)~[~/projects]
(vegas@VEGAS)~[~/projects]
$ cat /etc/passwd
root:x:0:0:root:/bin:/usr/sbin/nologin
daemon:x:1:1:daemon:/usr/sbin:/usr/sbin/nologin
bin:x:2:2:bin:/bin:/usr/sbin/nologin
sys:x:3:3:sys:/dev:/usr/sbin/nologin
sync:x:4:65534:sync:/bin:/bin/sync
games:x:5:60:games:/usr/games:/usr/sbin/nologin
man:x:6:12:man:/var/cache/man:/usr/sbin/nologin
lp:x:7:7:lp:/var/spool/lpd:/usr/sbin/nologin
mail:x:8:8:mail:/var/mail:/usr/sbin/nologin
news:x:9:9:news:/var/spool/news:/usr/sbin/nologin
uucp:x:10:10:uucp:/var/spool/uucp:/usr/sbin/nologin
proxy:x:13:13:proxy:/bin:/usr/sbin/nologin
www-data:x:33:33:www-data:/var/www:/usr/sbin/nologin
backup:x:34:34:backup:/var/backups:/usr/sbin/nologin
list:x:38:38:Mail List Manager:/var/list:/usr/sbin/nologin
irc:x:39:39:ircd:/run/ircd:/usr/sbin/nologin
_apt:x:42:65534::/nonexistent:/usr/sbin/nologin
nobody:x:65534:65534:nobody:/nonexistent:/usr/sbin/nologin
systemd-network:x:998:998:systemd Network Management:/:/usr/sbin/nologin
dhcpcd:x:100:65534:DHCP Client Daemon,,,:/usr/lib/dhcpcd:/bin/false
messagebus:x:101:102::/nonexistent:/usr/sbin/nologin
tcpdump:x:102:103::/nonexistent:/usr/sbin/nologin
sshd:x:103:65534:/run/sshd:/usr/sbin/nologin
vegas:x:1000:1000:,,,:/home/vegas:/bin/bash
_galera:x:104:65534::/nonexistent:/usr/sbin/nologin
mysql:x:105:106:MySQL Server,,,:/nonexistent:/bin/false
snort:x:106:107:Snort IDS:/var/log/snort:/usr/sbin/nologin
_sentrypeer:x:107:108:/:/var/lib/sentrypeer:/usr/sbin/nologin
cntlm:x:108:65534:/:/var/run/cntlm:/bin/sh
stunnel4:x:992:992:stunnel service account:/var/run/stunnel4:/usr/sbin/nologin
_rpc:x:109:65534:/:/run/rpcbind:/usr/sbin/nologin
sslh:x:110:109:/:/nonexistent:/usr/sbin/nologin
_rpc:x:109:65534:/:/run/rpcbind:/usr/sbin/nologin
sslh:x:110:109:/:/nonexistent:/usr/sbin/nologin
```


sudouseraddbaributsa

```
(Jacques@Jacques)-[~/projects]  
$ sudo useradd Baributsa  
[sudo] password for Jacques:  
  
(Jacques@Jacques)-[~/projects]  
$
```

Groups

```
(Jacques@Jacques)-[~/projects]  
$ groups  
vegas adm cdrom sudo dip plugdev users  
  
(Jacques@Jacques)-[~/projects]  
$ |
```

groupsbaributsa

```
(vegas@VEGAS)-[~/projects] |  
$ groups ishimwe  
ishimwe : ishimwe  
  
(vegas@VEGAS)-[~/projects] |  
$ |  
$ |
```


