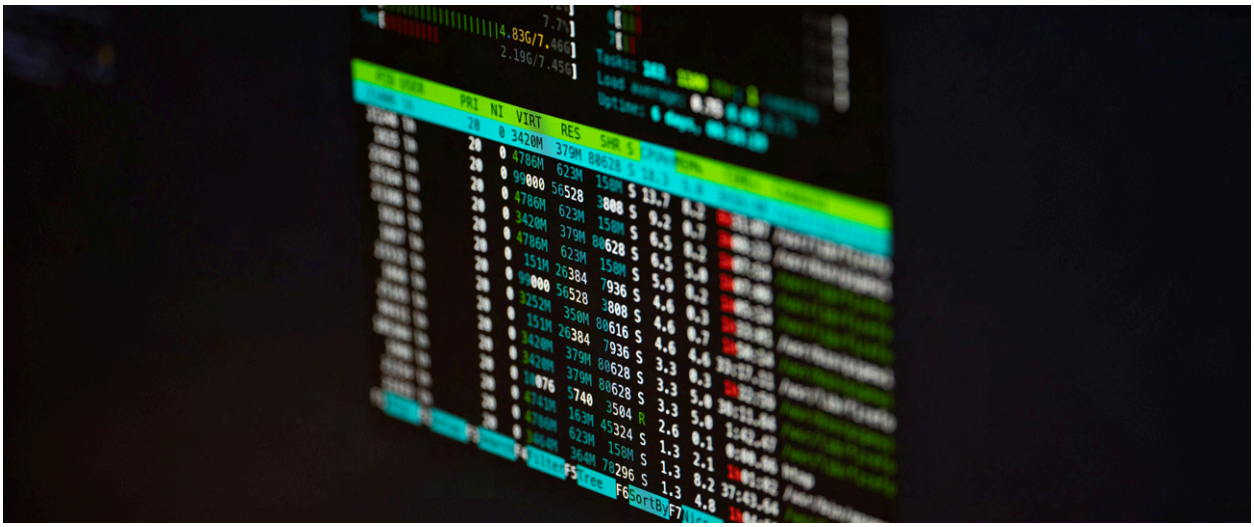


Command-Line Challenge #1

- Sunday, 13 July 2025

▼ 1. List all files recursively under `/home` that are owned by `root` and have SUID set.

> `$ find . -user root -perm -4000 -type f`

```
┌──(jynx㉿kali)-[~]
└─$ find . -user root -perm -4000 -type f
./CTFs/CTF-Lite/staging/vault/root_exploit.sh
./CTFs/CTF-Lite/staging/vault/hacker_key
./CTFs/CTF-Challenge-3/bin/.secret_exec
```

- `find .` - starting in current directory for the search recursively
- `-user root` - files owned by the root user
- `-perm -4000` - files with SUID bit set (4000 in octal)
- `-type f` - only regular files (not directories or special files)

▼ 2. Print full path + size of top 5 largest files inside home directory (recursively)

> `$ find . -type f -exec du -h {} + | sort -rh | head -5`

```
┌──(jynx㉿kali)-[~]
└─$ find . -type f -exec du -h {} + | sort -rh | head -5
1.5G    ./Desktop/forensics/vol3/Challenge.raw
256M    ./Desktop/forensics/zapftis.raw
256M    ./Desktop/forensics/0zapftis.vmem
32M     ./Desktop/forensics/0zapftis.rar
22M     ./volatility/.git/objects/pack/pack-324cd1acf5b696d347384d56a2ed77cbd8af858e.pack
```

- `find . -type f` - finds all regular file types recursively from the current directory
- `du -h` - shows disk usage in human-readable format (K, M, G)
- `sort -rh` - sorts in reverse order by human-readable numbers
- `head -5` - shows only the first 5 results
- `ls -lh` - shows file details in human-readable format

+ (plus sign)

- **Meaning**: Command terminator for `exec`
- **Purpose**: More efficient than `;` - groups multiple files into single command calls
- **Difference**: `+` runs `du -h file1 file2 file3` while `;` runs `du -h file1; du -h file2; du -h file3`
- **Security Note -** Both terminators are safe from shell injection because `find` passes arguments directly to the command without shell interpretation

▼ 3. Find all hidden `.txt` files inside your CTF directory.

> `$ find ~/CTFs -name ".*.txt" -type f`

```
┌──(jynx㉿kali)-[~]
└─$ find ~/CTFs -name ".*.txt" -type f
/home/jynx/CTFs/CTF-Lite/staging/secrets/.invisible.txt
```

`find ~/CTFs`

- `find`: The search command
- `~/CTFs`: Starting directory

`name ".*.txt"`

- `name`: Filter by filename pattern

- `".*.txt"`: Pattern for hidden files ending in `.txt`
- `.`: Files starting with dot (hidden files in Unix/Linux)
- `*`: Any characters in between
- `.txt`: Must end with .txt extension

`-type f`

- `-type`: Filter by file type
- `f`: Regular files only (not directories, links, etc.)

→ Additionally,

`-mtime -1`

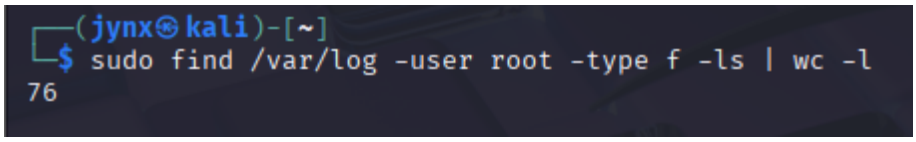
- `-mtime`: Modification time filter
- `1`: Less than 1 day ago (within last 24 hours)
- **Note**: `mtime -1` means "modified within the last 24 hours"

More precise with `mmin` (minutes)

`find ~/CTF -name ".*.txt" -type f -mmin -1440`

▼ 4. Count number of files inside `/var/log` owned by `root`.

> `$ sudo find /var/log -user root -type f -ls | wc -l`



`find /var/log`

- `find`: Search command
- `/var/log`: Starting directory (log files location)

`user root`

- `user`: Filter by file owner
- `root`: Username to match

`type f`

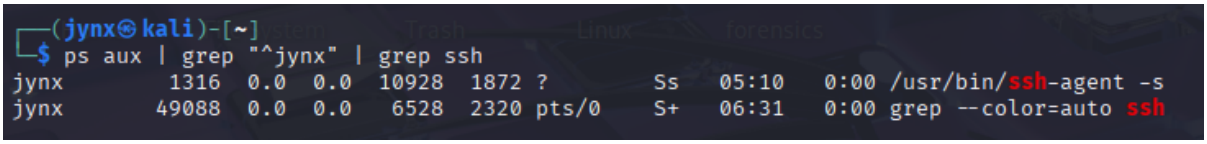
- `type`: Filter by file type
- `f`: Regular files only (excludes directories, links, etc.)

`| wc -l`

- `|`: Pipe operator
- `wc -l`: Word count with line count option
- **Result**: Counts the number of lines (= number of files found)

▼ 5. List all processes opened by user `jynx` that contain `ssh` in their name.

> `$ ps aux | grep "^jynx" | grep ssh`



`ps aux`

`ps` - "Process Status" or "Process Snapshot"

- `a`: Show processes from all users
- `u`: Display user-oriented format with detailed columns
- `x`: Include background processes without terminals

`grep "^jynx"`

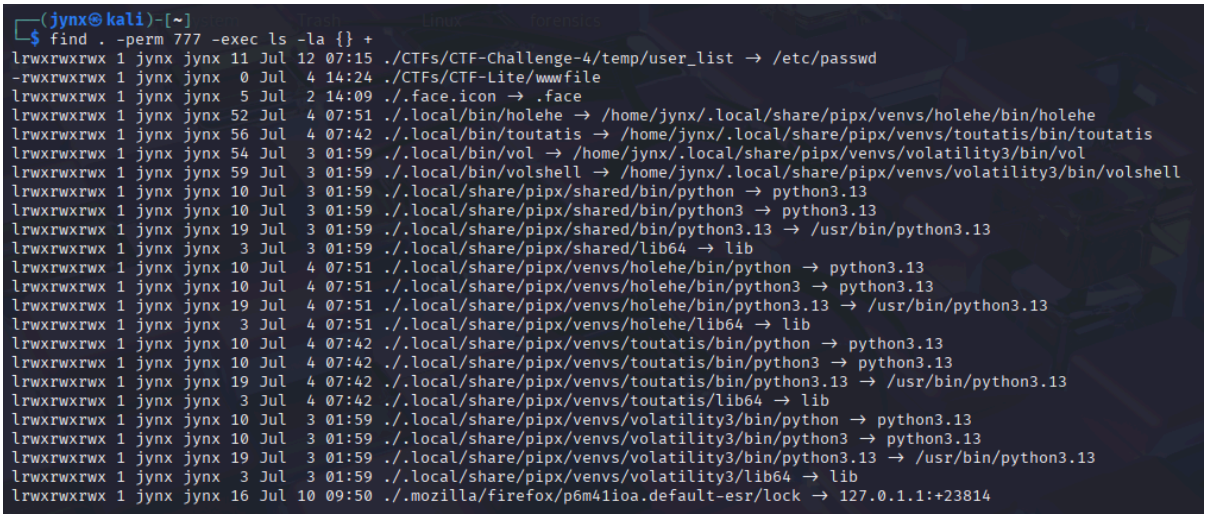
- `grep` - Searches for text patterns in input
- `"^jynx"`: Match lines starting with "jynx"
  - `^`: **Regular expression anchor** meaning "start of line"

`grep ssh`

- `grep ssh` → filters to SSH-related processes only

▼ 6. Find all files with 777 permissions and output their size, permissions, and full path.

> `$ find . -perm 777 -exec ls -la {} +`



- `find`: Command to search for files and directories recursively
- `.`: Current directory (starting point for search i.e. home directory in current example)
- `perm`: Filter by file permissions
- `777`: Octal permission value (rwxrwxrwx for all)
- `-exec`: Execute a command on each found file
- `ls`: List files command
- `la`: Option for `la` to show detailed file information including hidden files
- `{}`: Placeholder for found filenames
- `+`: Terminator that groups multiple files per command execution

▼ 7. Search all `.log` files for the keyword `ERROR` ignoring case, and print surrounding 2 lines of context.

> `$ find . -name "*.log" -exec grep -i -C 1 "ERROR" {} +`

```
┌──(jynx㉿kali)-[~]
└─$ find . -name "*.log" -exec grep -i -C 1 "ERROR" {} +
./Documents/app.log-2025-07-13 09:15:26 DEBUG Connecting to database
./Documents/app.log:2025-07-13 09:15:27 ERROR Failed to connect to database: Connection timeout
./Documents/app.log-2025-07-13 09:15:28 WARN Retrying database connection in 5 seconds
--
./Documents/app.log-2025-07-13 09:15:35 DEBUG User authentication attempt
./Documents/app.log:2025-07-13 09:15:36 ERROR Authentication failed: Invalid credentials
./Documents/app.log-2025-07-13 09:15:37 WARN User account locked after 3 failed attempts
--
./Documents/app.log-2025-07-13 09:15:44 WARN Memory usage approaching 50% threshold
./Documents/app.log:2025-07-13 09:15:45 ERROR Out of memory: Unable to allocate buffer
./Documents/app.log-2025-07-13 09:15:46 CRITICAL System instability detected
```

- `find`: Command to search for files and directories
- `.`: Current directory (starting point for search)
- `name`: Filter by filename pattern
- `"*.log"`: Pattern matching files ending with .log
- `exec`: Execute a command on each found file
- `grep`: Search for text patterns in files
- `i`: Ignore case (case-insensitive search)
- `C`: Context option (show lines before and after)
- `1`: Number of context lines (1 before and 1 after)
- `"ERROR"`: The text pattern to search for
- `{}`: Placeholder for found filenames
- `+`: Terminator that groups multiple files per command execution

▼ 8. List open ports and the associated process name + PID.

> `$ sudo netstat -tulpn`

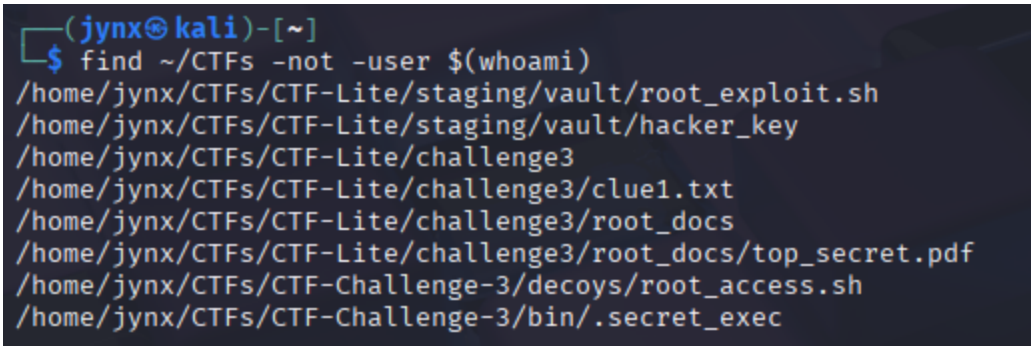
```
┌──(jynx㉿kali)-[~]
└─$ sudo netstat -tulpn
Active Internet connections (only servers)
Proto Recv-Q Send-Q Local Address           Foreign Address         State       PID/Program name
tcp        0      0 0.0.0.0:22              0.0.0.0:*               LISTEN      999/sshd: /usr/sbin
tcp6       0      0 :::22                   :::*                    LISTEN      999/sshd: /usr/sbin
udp6       0      0 fe80::2c0:7d92:5211:546 :::*                                754/NetworkManager
```

- `netstat`: Network statistics command or
  Try
  `ss` - Socket statistics (modern netstat replacement)

- `t`: TCP sockets
- `u`: UDP sockets
- `l`: Listening sockets only
- `p`: Show process information
- `n`: Don't resolve service names

▼ 9. Find all files that are not owned by the current user in your CTF folder.

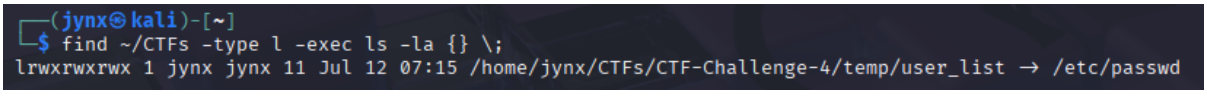
> `$ find ~/CTFs -not -user $(whoami)`



- `find ~/CTFs` - searches in the CTF directory
- `! -user $(whoami)` or `-not -user $(whoami)` - finds files NOT owned by the current user
- `$(whoami)` - gets the current username

▼ 10. Identify symbolic links inside `~/CTFs` and where they point.

> `$ find ~/CTFs -type l -exec ls -la {} \;`



- `find` - The command to search for files and directories
- `~/CTFs` - The starting directory to search in
- `type l` - Search criteria: only find symbolic links

    - `type` = specify file type
    - `l` = symbolic link (lowercase L)
- `exec` - Execute a command on each found file

`ls -la` - The command to execute on each found file

- `ls` = list files
- `l` = long format (detailed info)
- `a` = show all files (including hidden ones starting with .)

`{}` - Placeholder for the found file

- Gets replaced with the actual filename/path for each match

`\;` - End marker for the -exec command

- `\` = escapes the semicolon
- `;` = terminates the -exec command
- You can also use Plus sign `+`

▼ 11. Get last 3 login entries for all users.

> `last -3`

```
┌──(jynx㉿kali)-[~]
└─$ last -3
jynx     tty7         :0               Sun Jul 13 05:10 - still logged in
lightdm  tty7         :0               Sun Jul 13 05:10 - 05:10  (00:00)
jynx     tty7         :0               Sat Jul 12 11:41 - 12:19  (00:38)

wtmpdb begins Sat Jul 12 11:41:35 2025
```

- ***Alternative: Get last 3 entries with more details***

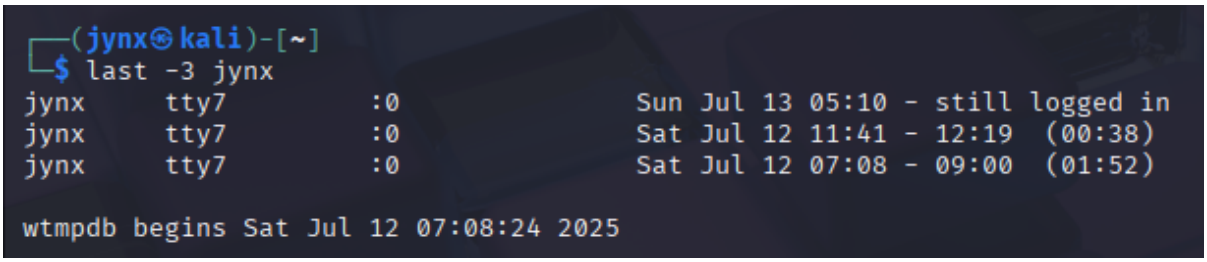
> `last -3 -F`

```
┌──(jynx㉿kali)-[~]
└─$ last -3 -F
jynx     tty7         :0               Sun Jul 13 05:10:25 2025 - still logged in
lightdm  tty7         :0               Sun Jul 13 05:10:02 2025 - Sun Jul 13 05:10:25 2025  (00:00)
jynx     tty7         :0               Sat Jul 12 11:41:35 2025 - Sat Jul 12 12:19:57 2025  (00:38)

wtmpdb begins Sat Jul 12 11:41:35 2025
```

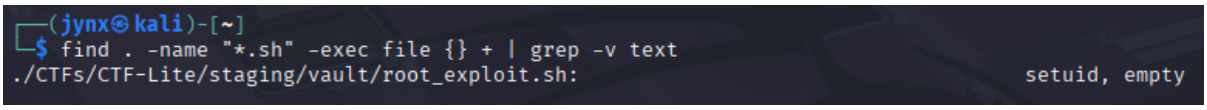
- ***Alternatively, to get last 3 logins for a specific user***

> `last -3 username`



▼ 12. Check file type of all `.sh` files and identify if any are actually binary.

> `$ find . -name "*.sh" -exec file {} + | grep -v text`



`find` - Search for files/directories

`.` - Start search from current directory (and subdirectories)

`-name` - Filter by filename pattern

`"*.sh"` - Pattern: any file ending with .sh

`-exec` - Execute a command on found files

`file` - Command to determine file type

`{}` - Placeholder for found filenames

`+` - Batch mode (pass multiple files to one command call)

`|` - Pipe output to next command

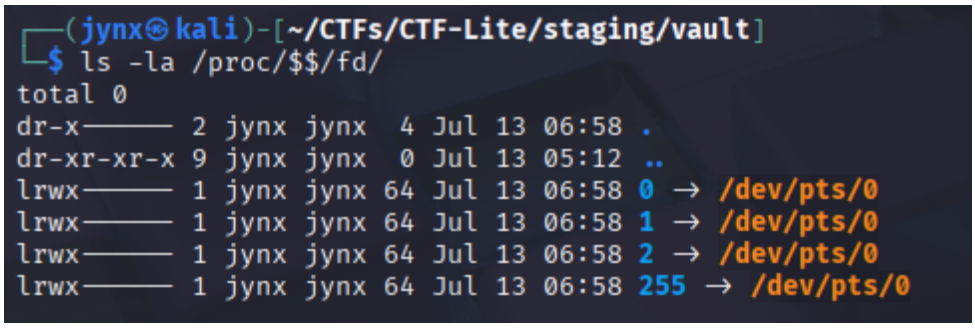
`grep` - Search/filter text

`-v` - Invert match (show lines that DON'T match)

`text` - Pattern to exclude (removes lines containing "text")

▼ 13. List all open file descriptors for your shell.

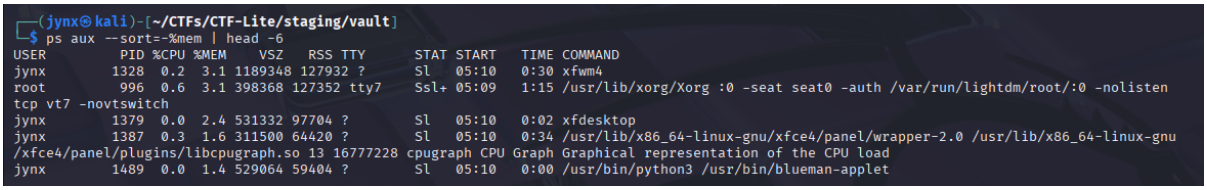
> `$ ls -la /proc/$$/fd/`



- `ls` - List directory contents
- `l` - Long format (detailed info: permissions, owner, size, etc.)
- `a` - Show all files (including hidden ones starting with .)
- `/proc/` - Virtual filesystem containing process information
- `$$` - Shell variable containing current process ID (PID)
- `/fd/` - Directory containing file descriptors for the process

▼ 14. Check memory usage of top 5 memory-hogging processes.

> `$ ps aux --sort=-%mem | head -6`



- `ps` - Show running processes
- `aux` - Display options:
  - `a` - Show processes for all users
  - `u` - Show user-oriented format (user, PID, CPU, memory, etc.)
  - `x` - Show processes without controlling terminal
- `--sort=-%mem` - Sort processes by memory usage:
  - `-sort=` - Sort flag

    - `-` - Descending order (highest first)
    - `%mem` - Sort by memory percentage
- `|` - Pipe output to next command
- `head` - Show first lines of input
- `6` - Show first 6 lines (1 header + 5 processes)

Result: Shows top 5 memory-consuming processes with header, sorted from highest to lowest memory usage.

Why `-6`? Because `ps` outputs a header row, so 6 lines = 1 header + 5 data rows.

Alternative sorting options:

- `-sort=-rss` - Sort by actual RAM usage
- `-sort=-vsz` - Sort by virtual memory size
- `-sort=-%cpu` - Sort by CPU usage