Text Viewing & Pipelines (Core)

Linux Commands Course · Section 5

Goal

Learn how to **view, count, redirect, and connect text streams** effectively.

Linux treats data as text flowing through pipelines — mastering this is key to powerful command-line work.

Viewing Text — less

less is the most convenient pager for reading long text output or files.

```
less /etc/passwd
```

Inside less:

- Space / Page Down → next page
- b / Page Up → previous page
- /pattern → search
- n / N → next/previous match
- q → quit

You can pipe output into it too:

```
ls -l /etc | less
```

Counting Text — wc

wc = **word count**, but it can count lines, words, and characters.

```
wc file.txt
```

Example output:

```
120  560  4200  file.txt
```

Columns = lines, words, bytes.

Count only lines:

```
wc -l file.txt
```

You can pipe text into wc:

```
cat /etc/passwd | wc -l
```

Redirection Basics

Every command has three data streams:

- **stdin (0)** — input
- **stdout (1)** — normal output
- **stderr (2)** — error output

You can redirect these streams to files.

Output Redirection

Write command output to a file:

```
echo Hello > message.txt
```

Append instead of overwrite:

```
echo World >> message.txt
```

Redirect both stdout and stderr to a single file:

```
command &> output.log
```

Send only errors:

```
command 2> errors.log
```

Discard unwanted output:

```
command > /dev/null 2>&1
```

Input Redirection

Feed a file as input to a command:

```
sort < unsorted.txt
```

This reads from `unsorted.txt` instead of keyboard input.

Pipelines — |

The **pipe operator** (|) connects one command's output to another's input.

```
cat /etc/passwd | grep bash | wc -l
```

This example:

1. Reads /etc/passwd
2. Filters lines containing "bash"
3. Counts them

Pipelines chain tools to form complex processing flows.

Here-Documents (<<)

A here-document feeds a block of text directly into a command.

```
cat <<EOF > welcome.txt
Welcome to Linux!
This file was generated from a here-doc.
EOF
```

Everything until EOF is sent as input to cat and saved into the file.

You can use any marker instead of EOF.

Here-Strings (<<<)

Feed a **single line of text** as input:

```
cat <<< "Hello from here-string"
```

Equivalent to:

```
echo "Hello from here-string" | cat
```

Splitting and Merging Streams — tee

`tee` writes output to **both the terminal and a file** simultaneously.

```
ls -l | tee listing.txt
```

Append instead of overwrite:

```
ls -l | tee -a all_listings.txt
```

Useful for saving logs while still viewing output live.

Combine Multiple Sources — paste

`paste` merges lines from multiple files side by side.

Example:

```
paste names.txt ages.txt
```

Output:

```
Alice   25
Bob     30
Charlie 28
```

You can specify a custom delimiter:

```
paste -d ":" file1 file2
```

Compare Common Lines — comm

comm compares two sorted files line by line.

```
comm fileA fileB
```

Columns:

1. Lines unique to fileA
2. Lines unique to fileB
3. Lines common to both

Hide specific columns:

```
comm -12 fileA fileB    # show only common lines
```

Files must be **sorted** beforehand.

Join Files by Common Field — join

`join` merges two files based on a shared column (like a database join).

Example:

```
join users.txt departments.txt
```

Use `-1` and `-2` to choose which fields to join on:

```
join -1 1 -2 2 file1 file2
```

Sort both files first for reliable results.

Combining Tools in Pipelines

Real power comes from chaining commands.

Example — count unique shell types:

```
cat /etc/passwd | cut -d: -f7 | sort | uniq -c
```

Another example — save and view results:

```
ps aux | grep ssh | tee ssh_processes.txt | wc -l
```

Recap

- **less** — scroll through text interactively
- **wc** — count lines, words, or characters
- **>**, **>>**, **2>**, **&>** — redirect output and errors
- **|** — pipe between commands
- **<<**, **<<<** — here-docs and here-strings
- **tee**, **paste**, **join**, **comm** — split, merge, and compare streams

Together, these form the foundation of Linux text processing.

Practice

1. Count how many users have `/bin/bash` in `/etc/passwd`.
2. Redirect all output of `ls -lh /etc` into a file.
3. Append the date to that same file using `>>`.
4. Merge two lists of names using `paste`.
5. Compare two text files for common lines using `comm`.
6. Use a pipeline with `tee` to save and count results simultaneously.

Next Up

Text Processing (Core → Plus) — pattern matching and stream editing with grep, sed, and awk.