



Intro to Command Line

IT&CSA Dark Mode
Anna Pratt :)



What is Command Line?

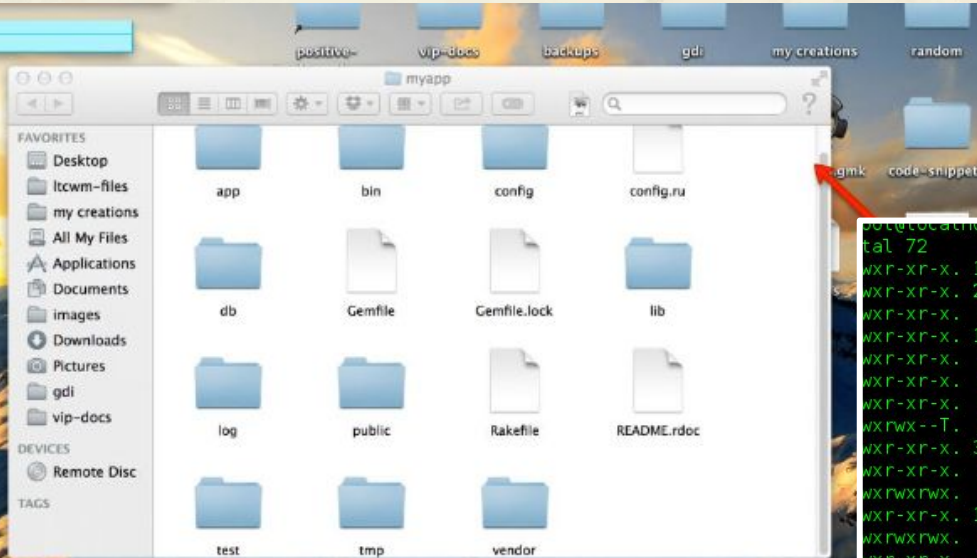
The command line, or command-line interface (CLI), is “a text-based interface that allows you to type commands via lines of text that are then processed by the computer.”

This means that you can type just a few words and characters into your computer in order to execute powerful and efficient instructions.



GUI vs CLI

Command Line Interface



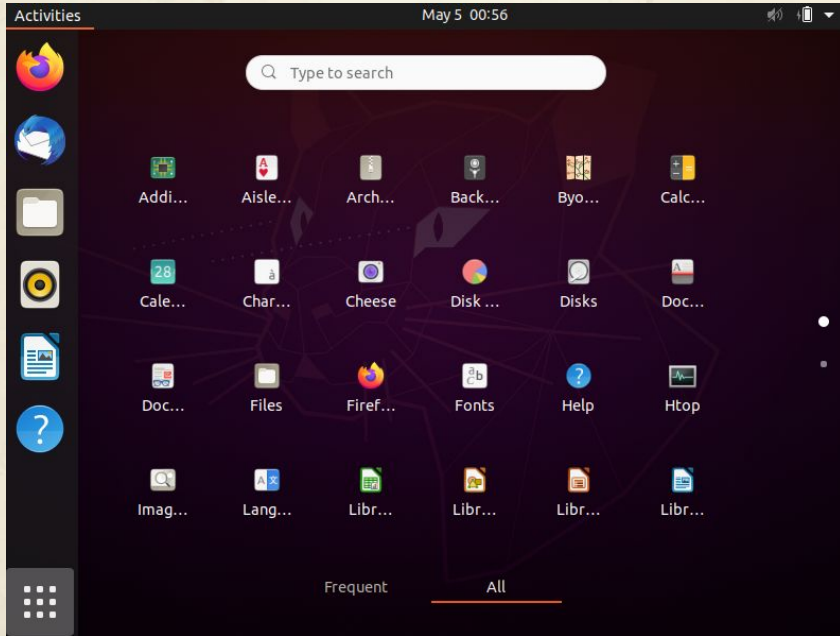
```
pot@localhost varj# ls -la
total 72
wxr-xr-x. 18 root root 4096 Jul 30 22:43 .
wxr-xr-x. 23 root root 4096 Sep 14 20:42 ..
wxr-xr-x.  2 root root 4096 May 14 00:15 account
wxr-xr-x. 11 root root 4096 Jul 31 22:26 cache
wxr-xr-x.  3 root root 4096 May 18 16:03 db
wxr-xr-x.  3 root root 4096 May 18 16:03 empty
wxr-xr-x.  2 root root 4096 May 18 16:03 games
wxrwx--T.  2 root gdm  4096 Jun  2 18:39 gdm
wxr-xr-x. 38 root root 4096 May 18 16:03 lib
wxr-xr-x.  2 root root 4096 May 18 16:03 local
wxrwxrwx.  1 root root  11 May 14 00:12 lock -> ../run/lock
wxr-xr-x. 14 root root 4096 Sep 14 20:42 log
wxrwxrwx.  1 root root  10 Jul 30 22:43 mail -> spool/mail
wxr-xr-x.  2 root root 4096 May 18 16:03 nis
wxr-xr-x.  2 root root 4096 May 18 16:03 opt
wxr-xr-x.  2 root root 4096 May 18 16:03 preserve
wxr-xr-x.  2 root root 4096 Jul  1 22:11 report
wxrwxrwx.  1 root root   6 May 14 00:12 run -> ../run
wxr-xr-x. 14 root root 4096 May 18 16:03 spool
wxrwxrwt.  4 root root 4096 Sep 12 23:50 tmp
wxr-xr-x.  2 root root 4096 May 18 16:03 yp

pot@localhost varj# yum search wiki
Loaded plugins: langpacks, presto, refresh-packagekit, remove-with-leaves
infusion-free-updates
infusion-free-updates/primary_db
infusion-nonfree-updates
```

Graphical User Interface

Linux

Ubuntu Desktop

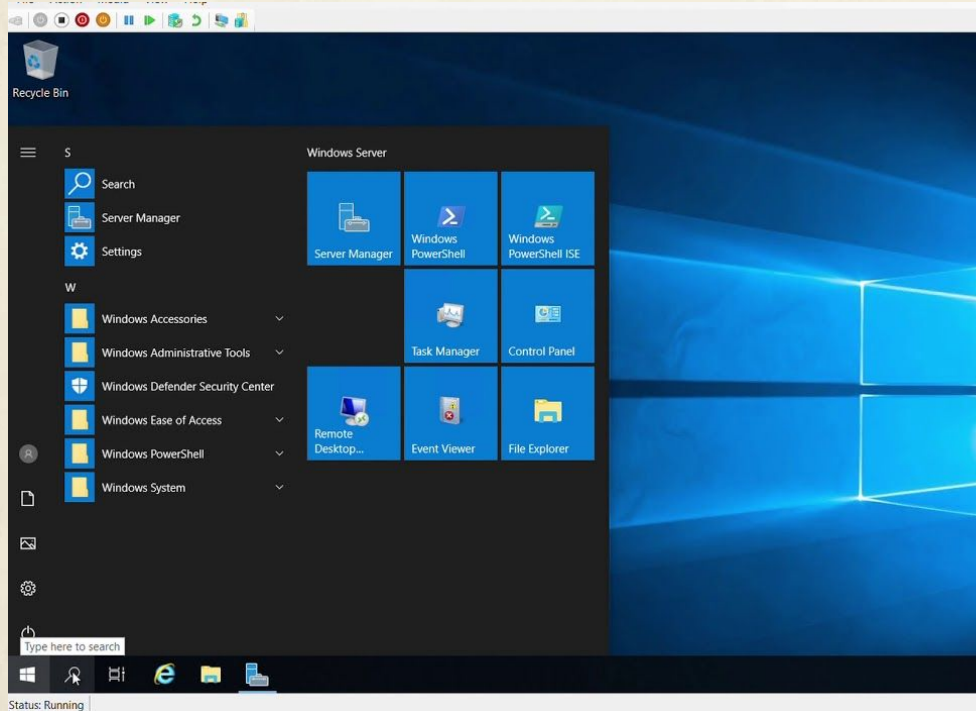


Ubuntu Server

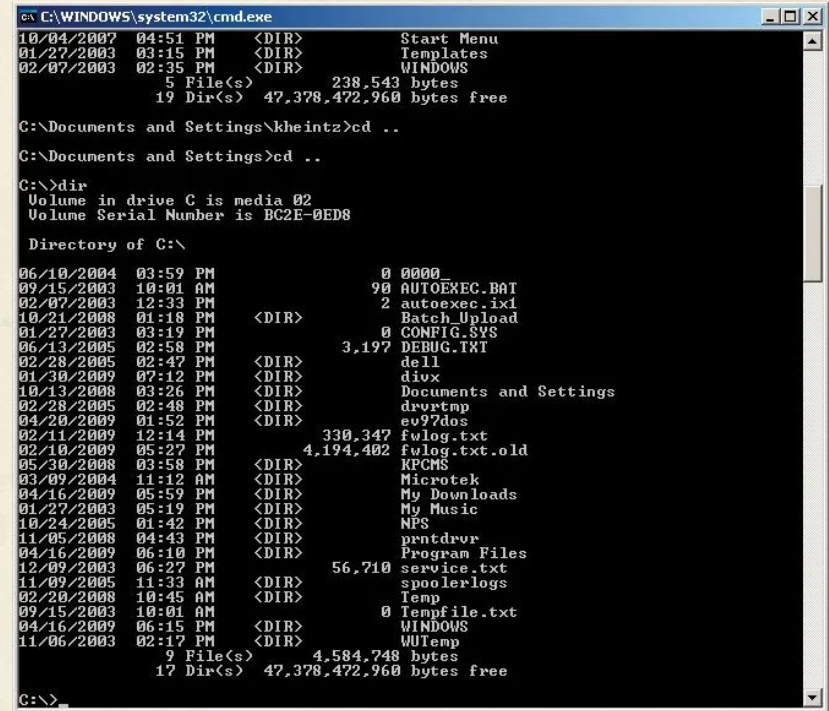
```
root@ip: ~  
root@ip's password:  
Welcome to Ubuntu 18.04.2 LTS (GNU/Linux 4.15.0-45-generic x86_64)  
  
* Documentation:  https://help.ubuntu.com  
* Management:    https://landscape.canonical.com  
* Support:        https://ubuntu.com/advantage  
  
* Canonical Livepatch is available for installation.  
  - Reduce system reboots and improve kernel security. Activate at:  
    https://ubuntu.com/livepatch  
New release '20.04.2 LTS' available.  
Run 'do-release-upgrade' to upgrade to it.  
  
Last login: Thu Apr 29 14:47:05 2021 from 10.1.149.227  
root@ip:~# networkctl status  
* State: routable  
  Address: 10.1.149.55 on ens192  
           fe80::250:56ff:fe91:69a8 on ens192  
  Gateway: 10.1.149.1 (Palo Alto Networks) on ens192  
           DNS: 10.1.149.10  
              1.1.1.1  
Search Domains: cloud.local  
root@ip:~#
```

Windows

Windows Server 2019



MS DOS (Pre-GUI)



MacOS



Linux CLI



LINUX CLI – Key Terms

- **Command:** A given order that the computer runs as an instruction for the operating system.
- **Terminal:** The terminal is the actual interface in which you run commands.
- **Shell:** The shell is the software program that takes your plain-text commands and interprets them as instructions to send to the operating system.
 - Examples: *bash* (bourne again shell), *ksh* and *zsh* are shells run on MacOS.

LINUX CLI – Walkthrough

- **ls:** list commands of a directory
- **pwd:** print working directory path
- **cd:** change directory
- **mkdir:** make a new directory
- **mv:** move or rename files
- **rm:** delete files or directories
- **Touch:** create empty file
- **ln -s:** create symbolic link
- **cat:** display file contents
- **Clear:** clear the terminal
- **echo:** print any text that follows the command
- **less:** display paged output in the terminal
- **man:** display help for a certain linux command
- **uname:** get basic OS information
- **whoami:** see the current user in the shell
- **grep:** search for a certain word/phrase in a body of text
- **head:** return top lines of a body of text
- **tail:** return bottom lines of a body of text
- **ping:** send ping packets to networked device

www.digitalocean.com/community/tutorials/linux-commands

Syntax of a Linux Command

nmap

-p

443

192.168.0.1

command

tack/flag

Flag
argument

Command argument

The background is a light cream color with a subtle watercolor texture. It is decorated with several orange watercolor stars of varying sizes, some of which are partially obscured by the text. There are also green watercolor leaves and branches, some of which are partially obscured by the text. The overall style is soft and artistic.

Practice:

cmdchallenge.com

Windows CLI (Powershell)





What is Powershell?

Anything that can be done in Command Prompt can be done in PowerShell. However, PowerShell has advanced and administrative features. In PowerShell, you can run scripts and batch commands, enable or disable windows features, manage Windows servers, or manage the local Windows computer.

If you plan on being a Windows System Administrator or if you plan on defending Windows Computers, you need to learn PowerShell. It's a must! With PowerShell you will be able to manage the computer and Windows Domain in ways that you can't do with the GUI. The true power (and danger) of Windows Access comes through PowerShell.



Powershell interface

```
PS C:\> Get-ChildItem 'MediaCenter:\Music' -rec !  
>> where < -not $_.PSIsContainer -and $_.Extension -match 'wma|mp3' > !  
>> Measure-Object -property length -sum -min -max -ave  
>>
```

```
Count      : 1307  
Average    : 5491276.09563887  
Sum        : 7177097857  
Maximum    : 22905267  
Minimum    : 3235  
Property   : Length
```

```
PS C:\> Get-WmiObject CIM_BIOSElement | select biosv*, man*, ser* | Format-List
```

```
BIOSVersion : <TOSCPL - 6040000, Ver 1.00PARTTBL>  
Manufacturer : TOSHIBA  
SerialNumber : M821116H
```

```
PS C:\> <[wmiSearcher]@'  
>> SELECT * FROM CIM_Job
```

POWERSHELL CLI – Key Terms

- **Command:** PowerShell has a couple different types of commands that can be run in the shell. Commands in PowerShell can be native executables, cmdlets, functions, scripts, or aliases
- **Cmdlet:** A command. The name of each cmdlet is made of a “Verb-Noun” pair, like for example Get-Process.
- **Terminal:** Actual interface in which you run commands.
- **Shell:** The shell is the software program that takes your plain-text commands and interprets them as instructions to send to the operating system.

Syntax of a Powershell Command

Get-FileHash **input.txt**

cmdlet

Command argument

POWERSHELL – Walkthrough

- **netstat:** list all network connections
- **tasklist:** see current running processes
- **Get-ChildItem:** list all items in a directory
- **whoami:** see user currently logged in
- **ipconfig:** see the internet interface information
- **systeminfo:** see information about the system
- **net user:** see all users on a system
- **net user <username> *:** change user password
- **net localgroup:** see all user groups on a system
- **net localgroup “<group>” <username> /add:** add a user to a group

Practice:

programminghistorian.org/en/lessons/intro-to-powershell

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