

# Windows CLI

Command Line Interface

11th October 2021

## What we're going to cover this evening

- What is a CLI
- How did it evolve - a bit of history
- Windows CLI
- Options today on Windows
- Windows Terminal
- Demo time!

# What is a CLI?

- A form of 'Shell'
  
- What is a 'Shell'?
  - A computer program that exposes an operating system to a human or other program
  - Named as it is the outermost layer around the operating system
  - Can take the form of:
    - CLI - Command Line Interface
    - GUI - Graphical User Interface

# Windows Shells

- Originally MS-DOS or Microsoft Disk Operating System had a primary shell known as 'COMMAND.COM'
- Released in August 1981, interface was CLI based
- Windows 1.0 was released November 1985
- Ran as a GUI program **on top** of MS-DOS CLI
- Continued this way up to Windows 3.11
- Windows 95, 98 and Me (millenium edition) - hid it better, but also were technically DOS based underneath

# Slight Segue - The Two Flavours of Windows

- First, the original DOS based flavour - through to Windows Me
- In parallel there was Windows NT
  - Naming is questionable:
    - “New Technology”
    - “WNT” is a one letter increment of “VMS”
    - Originally targeted the Intel i860 processor code named N10 (“N-Ten”)
  - A development of IBMs OS/2 operating system
  - Released in 1993 as Windows NT 3.1 - as business targeted version of Windows
  - Saw further development as: Windows NT 3.5, 3.51, 4.0
  - Eventually as Windows 2000
- Completely different architecture to ‘classic’ Windows with core NT kernel that ran a GUI on top and provided an emulated ‘COMMAND.COM’ experience within it known as ‘cmd.exe’.
  - Note: a ‘Kernel’ is the heart of an operating system - provides the interface for applications (‘user-land’) to the underlying hardware
- Built for Enterprise from the ground up - robust security, process control, journaling file system, encryption, advanced networking etc etc.

# Unification

- Windows XP released in 2001 saw Microsoft merge its consumer and business operating system development
- The older 'DOS' based approach fell away and the Enterprise 'NT' kernel won
- The approach remains what we see today in Windows 11
- Windows Vista -> 7 -> 8.0 -> 8.1 -> 10 -> 11
  - All follow the same core architecture
  - Core Windows kernel with a GUI on top, with an emulated CLI inside for backwards compatibility
- The 'Enterprise' versions:
  - 2000 -> 2003 -> 2003R2 -> 2008 -> 2008R2 -> 2012 -> 2012R2 -> 2016 -> 2019 -> 2022
  - Are also built on the same core architecture - with specifics for business use cases of course

# Today

- Windows 10/11 have four (or more) 'CLI' environments available
- Two come pre-installed:
  - Command Prompt or 'cmd.exe'
    - Emulated version of the original 'command.com'
    - Provides a basic CLI interface
  - Windows PowerShell
    - Full scripting environment - allowing automation of a variety of aspects of Windows
    - Initially released in 2006
    - Came pre-installed from Windows 7 (Windows Server 2008R2)
- We'll talk about the other two later.

# Why use a CLI?

- Can be faster - if you know what you're doing
- Uses less memory, can be more efficient
- Provides mechanisms to 'batch' or chain commands together
  - Sometimes also called 'scripting'
  - Create new levels of automation - do lots of things without interaction
  - DRY - don't repeat yourself
  - Repeatability

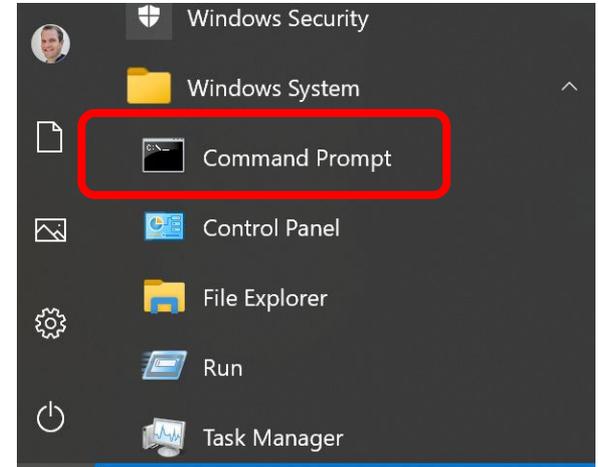
# Two ways to use a CLI on windows

## 1) Directly

- Either by finding Command Prompt in the Start Menu
- Or by typing it in the Search Box:

“Command”

“Cmd”



## 2) Windows Terminal from the Microsoft Store:



# Demo Time

cmd.exe

# PowerShell

- Windows PowerShell
  - Full scripting environment - allowing automation of a variety of aspects of Windows
  - Initially released in 2006
  - Came pre-installed from Windows 7 (Windows Server 2008R2)
  - Updated through each release of Windows up to v5.1
  
- Also the 3rd common CLI available:
  - PowerShell Core - now simply 'PowerShell' or 'Microsoft PowerShell'
  - Essentially released as v6 of PowerShell - but many compatibility issues
  - Syntax is almost identical - but now supported on Mac and Linux and open source
  - v7 now main stream not 100% backwards compatible - but close enough

# Demo Time

PowerShell

# The 4th CLI - Linux

Windows Subsystem for Linux - WSL

Installable via the Windows Store (and a “`wsl --install`”)

Brings a full Linux ‘Container’ to Windows

Allows a whole world of other scripting languages

Way beyond the scope of today, but let’s take a quick look....

# Demo Time

WSL

# Fin.

Any questions?