

# Making the Command Line Great Again

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# Background – Linux on Windows

## Developer Landscape

- Bash
- Linux tools
- Linux-first tools

## Problem

- Assume environment behaves like Linux

## Solution

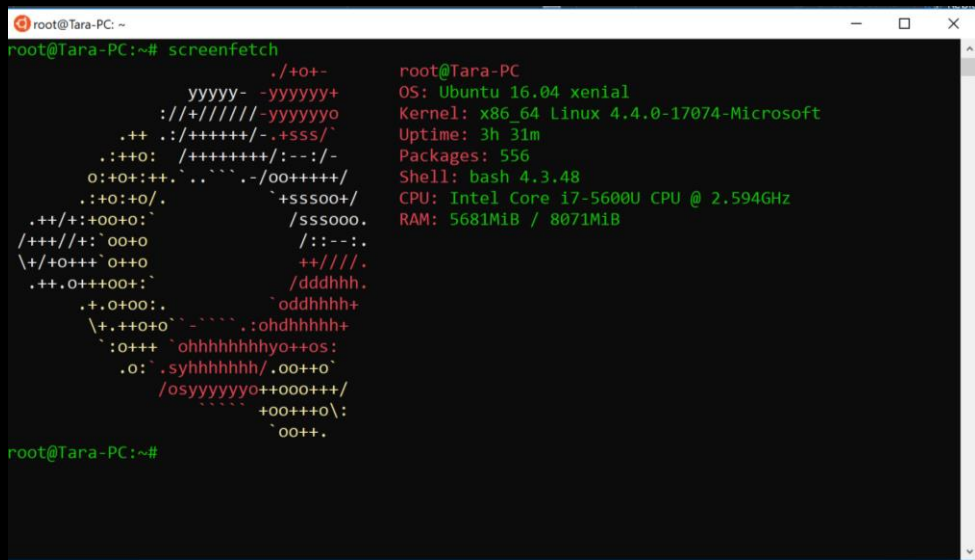
- Linux tools on Windows 10

# Linux Tools on Windows

- The Windows Subsystem for Linux
- Important Dev Environment Tools
- In-box Linux Tools

# Windows Subsystem for Linux (WSL)


- Lets developers run unmodified, "native" Linux environments
- Without the overhead of a VM
- Via the command line




```
root@Tara-PC: ~  
root@Tara-PC:~# screenfetch  
      .+/+0+-          root@Tara-PC  
      yyyyyy- -yyyyyy+ OS: Ubuntu 16.04 xenial  
      ://+///// -yyyyyyo Kernel: x86_64 Linux 4.4.0-17074-Microsoft  
      .++ .:/+++++/- .+sss/` Uptime: 3h 31m  
      .:++o: /+++++++/--:/- Packages: 556  
      o:+o:++ .` .` .-/oo+++++ Shell: bash 4.3.48  
      .:+:+o/. `+sss0o+ CPU: Intel Core i7-5600U CPU @ 2.594GHz  
      .++/+:+oo+o` /sss0oo. RAM: 5681MiB / 8071MiB  
      /+++//+:`oo+o /:--:.  
      \+/+o+++`o+o+o ++///.  
      .++ .o+++oo+o` /dddhhh.  
      .+.o+oo: . `oddhhhh+  
      \+.+o+o+` .` .` .:ohdhhhhh+  
      :o+++ `ohhhhhhhhyo++os:  
      .o:` .syhhhhhhh/.oo+o`  
      /osyyyyyyo++oo+++/  
      +oo+++o\  
      `oo++.  
root@Tara-PC:~#
```


# Wow!

- WSL is only ~24 months old!
  - 2016-04: Unveiled during Build 2016
  - 2016-04: First Win10 Insiders build
  - 2016-08: Shipped in Win10 Anniversary Update
  - 2017-03: HUGE improvements in Creators Update
  - 2017-09: More BIG improvements in Fall Creators Update (FCU)
  - 2018-Spring: More sophistication
- Reception has been AMAZING!


 Wow, its been a while since I had to update with apt-get. And on #Windows10 no less. #Bash + Windows is glorious. Way better than cygwin.

 Tomi Savolainen 10h  
@tomi\_savolainen

#Bash on #Ubuntu on #Windows is probably the best thing that has happened to windows since ever!  
#pureAwesomeness

 William Pearce 11h  
@pearcewg

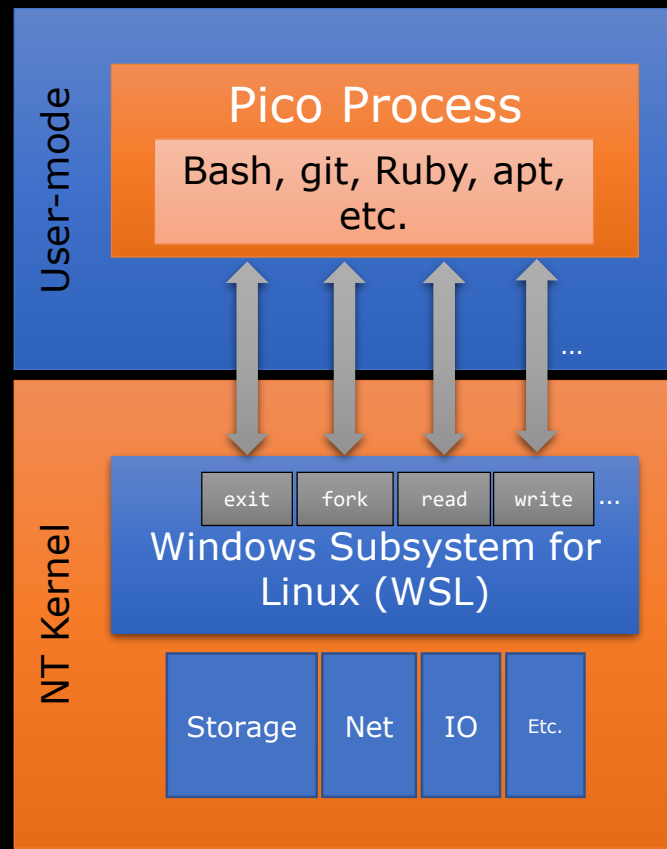
Cross-platform #development on #Windows is suddenly awesome  
[medium.com/@bgourlie/cros...](https://medium.com/@bgourlie/cros...) #programming #code #linux #bash #java

 SP 5d  
@SamuelPoyser

Discovering the Linux bash terminal on Windows 10 is honestly the best thing to happen to me for months

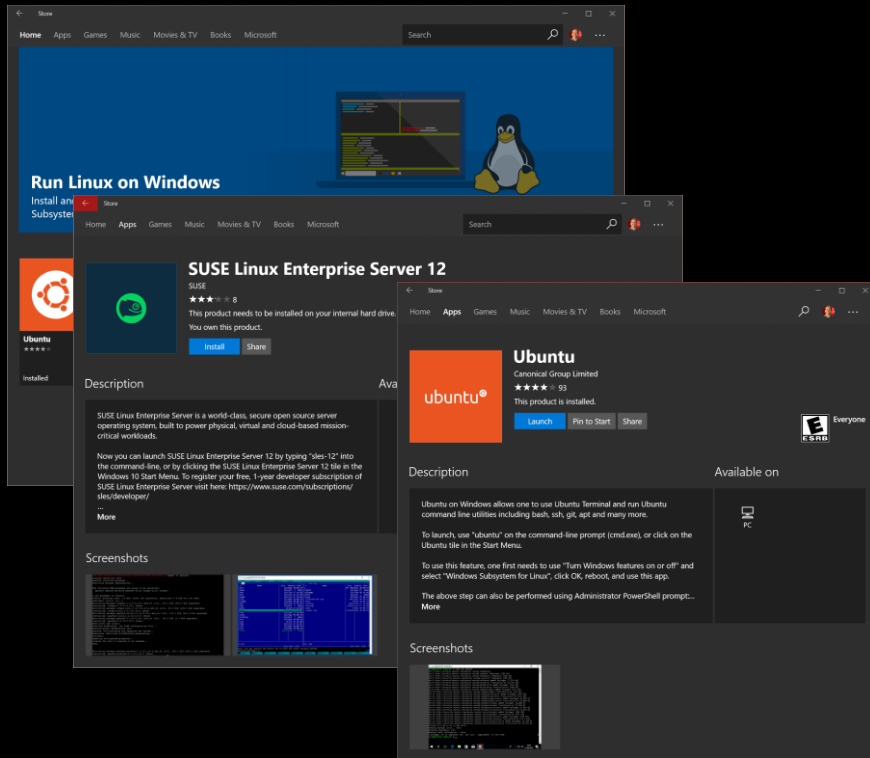
# How does WSL work?

- **NO VM's!**
- Genuine Linux ELF64 binaries loaded into lightweight "PicoProcesses"
- WSL exposes Linux-compatible System Call Interface (SCI) & calling convention
  - Component of NT Kernel
- Utilizes existing NT Kernel API's
  - Shares network, storage, IO, etc. with Windows host



# Distros in the Windows Store

- WSL is “just the kernel & OS bits”
- Distro’s come from the Store
  - Fast & reliable download & installation
  - Simple servicing
- Install multiple distros side-by-side!
  - Ubuntu
  - openSUSE & SLES
  - Others (launched this week!)
- Run simultaneously!
  - Tiny footprint vs. VM’s



Demo - Distros in the store  
& Running Ubuntu on WSL



# Background Task Support

- WSL processes continue running after console windows are closed
- Great for running websites & services in background
  - Site generator/host - Node/Jekyll/Ruby/.NETCore/Python/etc.
  - Websites & services - httpd/lighttpd/etc.
  - Databases - MySQL/MariaDB/Redis/etc.
  - sshd

# Demo - Interop & Background Tasks

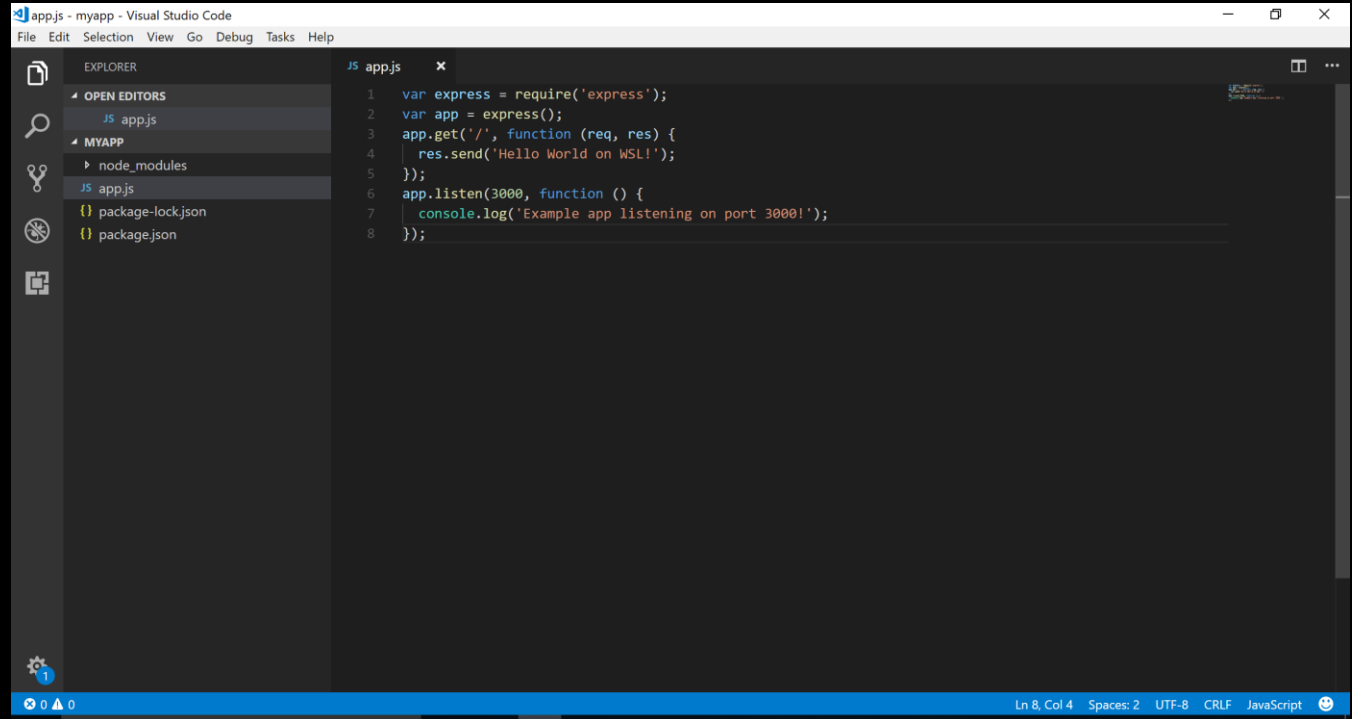
# Other Features

- Wslpath
- DrvFS case sensitivity
- WSLENV
- wsl.conf
- AF\_UNIX and AF\_UNIX interop

Demo - Spring 2018 New WSL Features

# WSL in your Dev Environment

- VS Code
- Console



The screenshot shows the Visual Studio Code interface with a file explorer on the left and a code editor on the right. The file explorer shows a project structure with folders 'node\_modules' and 'app.js', and files 'package-lock.json' and 'package.json'. The code editor displays the following JavaScript code:

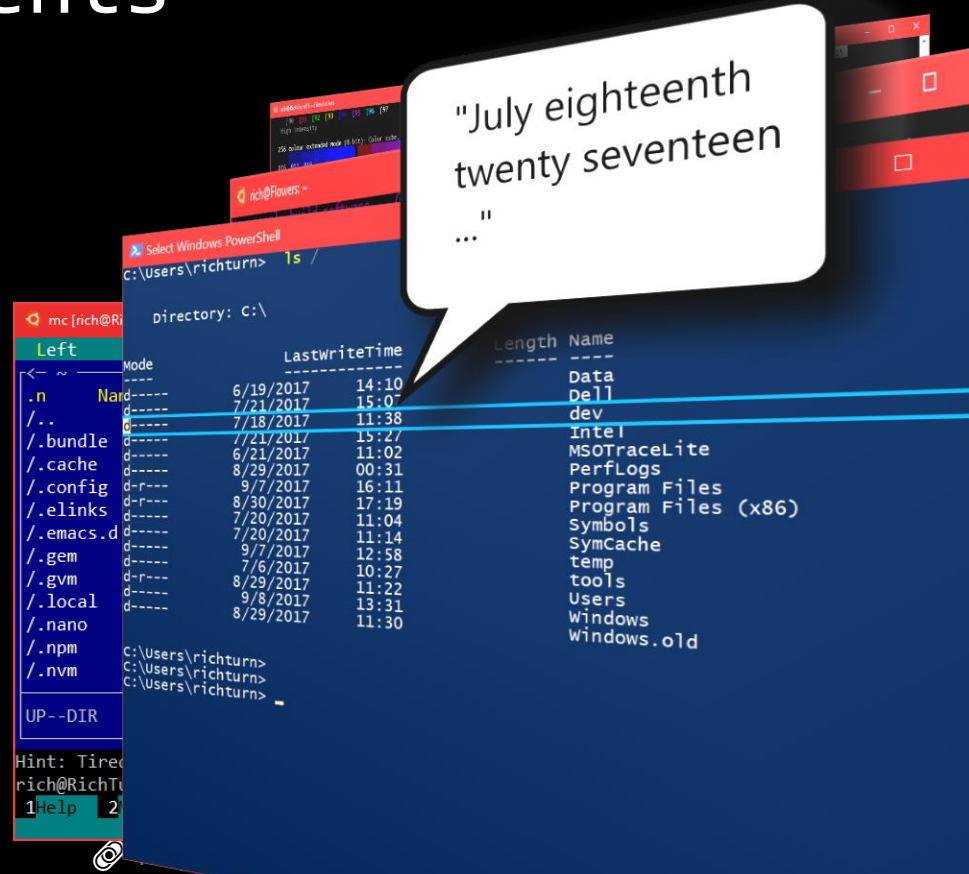
```
1 var express = require('express');
2 var app = express();
3 app.get('/', function (req, res) {
4   res.send('Hello World on WSL!');
5 });
6 app.listen(3000, function () {
7   console.log('Example app listening on port 3000!');
8 });
```

The status bar at the bottom indicates the current line and column (Ln 8, Col 4), the number of spaces (Spaces: 2), the encoding (UTF-8), the line ending (CRLF), and the language (JavaScript).

Demo - VS Code + WSL with Node.js

# Console Improvements

- Lots of bug fixes & improvements
- Glorious 24-bit TrueColor
- Improved default palette
- Improved VT support
  - vim, emacs, tmux, mc, etc.
- Mouse Support!
- Accessibility
  - Narrator navigation & read-out
- "The Grand Overhaul" continues...



Console demo



What's Next?

# What's next?

- More!
- More & deeper SYSCALLS!
  - Prioritized based on feedback & telemetry
- More disk perf improvements
- More networking improvements
- More integration & interop
  - VS code integration
  - Docker integration
- More Console improvements

To Infinity



And Beyond!

# Thank You

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Command Line Blog

<https://aka.ms/cliblog>

Learn WSL

<https://aka.ms/learnwsl>

Docs

<https://aka.ms/wsldocs>

Git Hub (Issues)

<https://github.com/Microsoft/WSL>

<https://github.com/Microsoft/Console>

UserVoice (Feature Asks)

<http://aka.ms/winbashuv>

