

Cross-Platform Management and Fun with PowerShell, the WSL, and Windows Terminal!

Mike Nelson – MVP, vExpert, CTA, MAA

Solutions Architect @ Pure storage

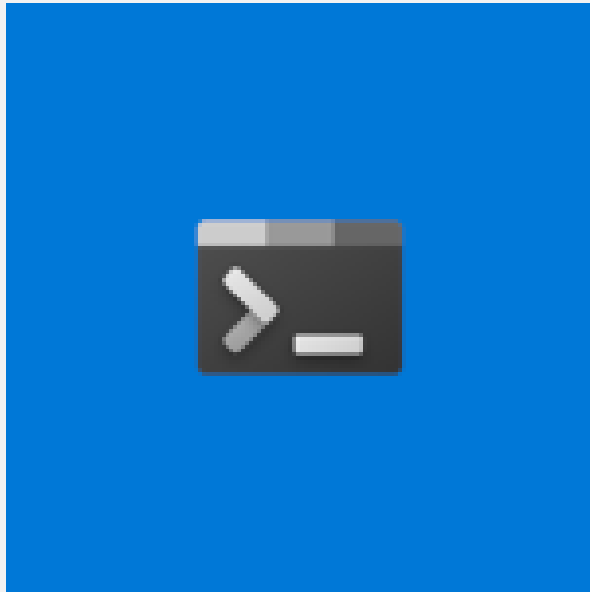
 @mikenelsonio

 mikenelson-io

Empowering Data & AI Transformation



Windows Terminal

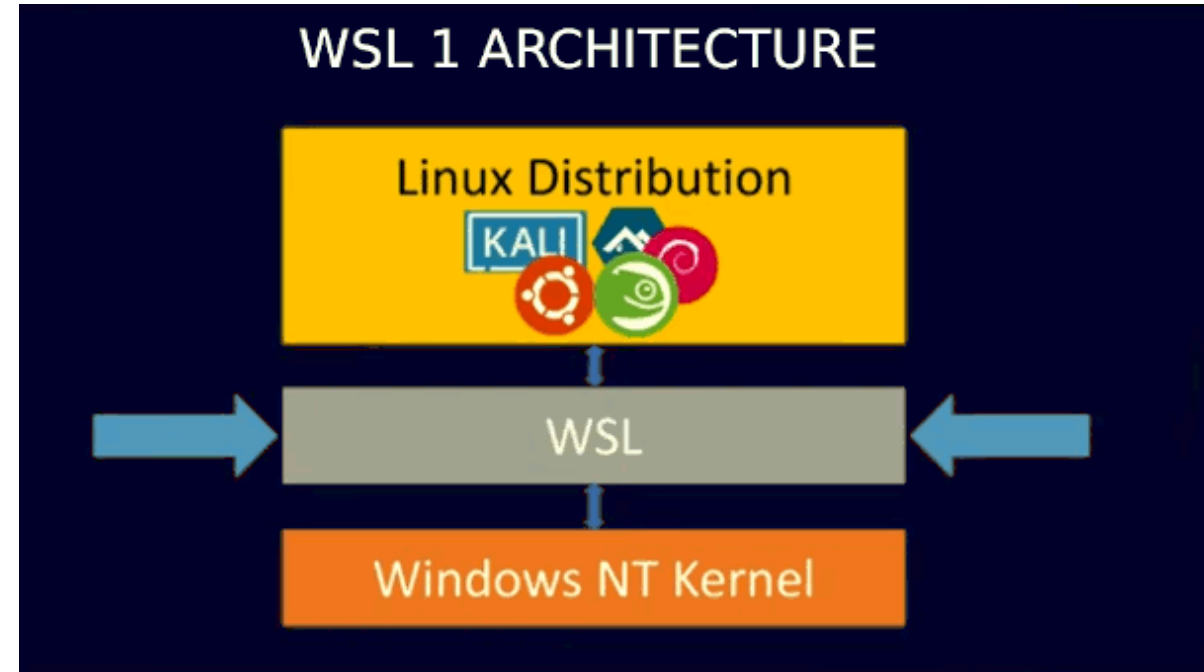


Windows Subsystem for Linux



WSL v1

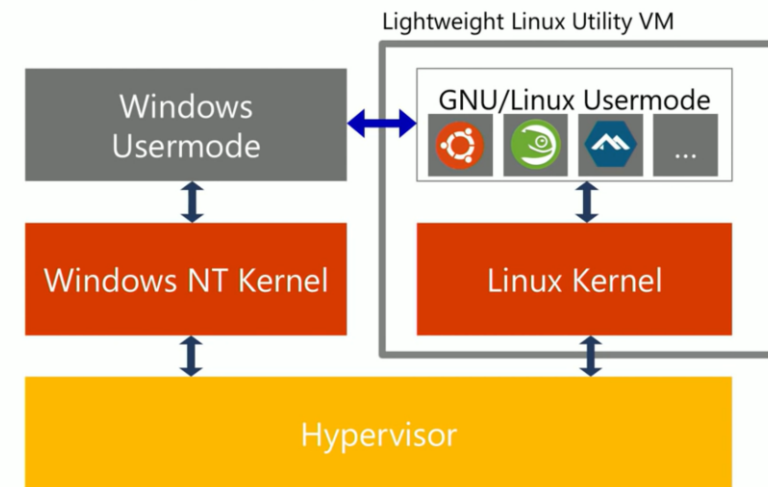
- August 2016 Ubuntu only
- Late 2017 Store images
- W10 1607+ & Server 2019
- Linux-compatible kernel with GNU
- Could not scale
- No systemd – no binaries



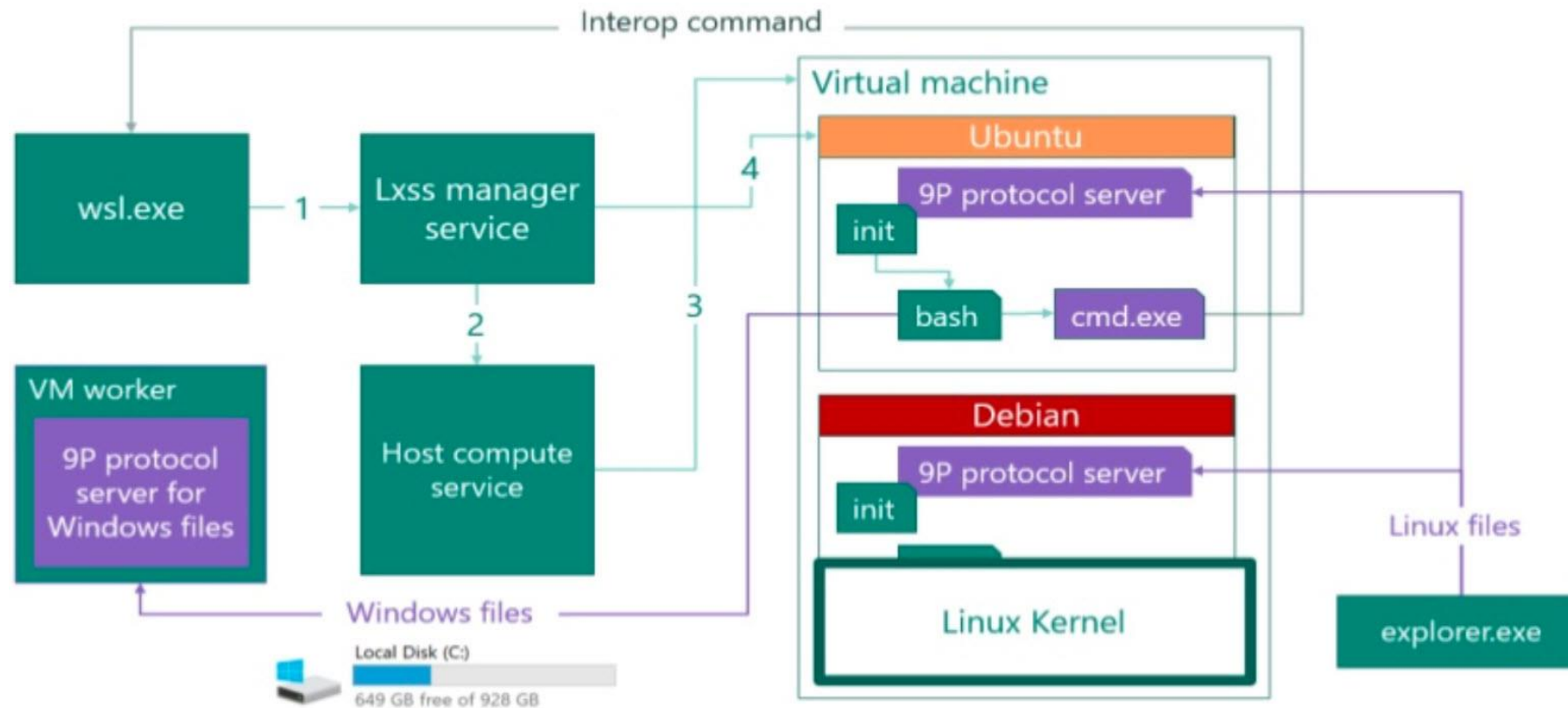
WSL v2 (so far)

- No longer emulating calls
- Type1 "Lightweight" Hypervisor running single VM with ext4 VHD
- One kernel running multiple distros
- Independent IP's
- New Docker backend
- Host filesystem accessible via 9P protocol (everything is a file)
- IFS Network Redirector for Linux file access

WSL 2 Architecture Overview



v2 Overall Architecture



WSL VERSION COMPARE

| Feature | WSL 1 | WSL 2 |
|---|-------|-------|
| Integration between Windows and Linux | ✓ | ✓ |
| Fast boot times | ✓ | ✓ |
| Small resource foot print | ✓ | ✓ |
| Runs with current versions of VMWare and VirtualBox | ✓ | ✓ |
| Managed VM | ✗ | ✓ |
| Full Linux Kernel | ✗ | ✓ |
| Full system call compatibility | ✗ | ✓ |
| Performance across OS file systems | ✓ | ✗ |

Credit: Patrick Wu



"WiP"

WSL Feature Availability

| | 1607 | 1703 | 1709 | 1803, 1809 | 1903, 1909 | 2004 |
|------------------------|------|------|------|------------|------------|------|
| lxc.exe | ✓ | ✓ | ✓ | | | |
| bash.exe/wslconfig.exe | ✓ | ✓ | ✓*1 | ✓*1 | ✓*1 | ✓*1 |
| <distro>.exe | | | ✓ | ✓ | ✓ | ✓ |
| wsl.exe | | | ✓ | ✓ | ✓*2 | ✓*2 |
| WSL Interoperability | | ✓ | ✓ | ✓ | ✓ | ✓ |
| DrvFS Mounting | | | ✓ | ✓ | ✓ | ✓ |
| wsl.conf | | | | ✓ | ✓*2 | ✓*2 |
| \$WSL_DISTRO_NAME | | | | | ✓ | ✓ |
| \$WSLENV | | | | ✓ | ✓ | ✓ |
| \\wsl\$\ | | | | | ✓ | ✓ |
| WSL2 | | | | | | ✓ |
| /mnt/wsl/ | | | | | | ✓ |

*1: Kept for backward compatibility

*2: feature of the function extended in these builds



Why?



Raised on *nix

Work on appliances

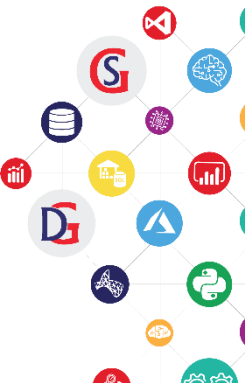
Cross-Develop

Docker Containers & Kubernetes (K8s / K3s)

Flexible automation & administration

VMs optional

It's fun to play with?



Developing in WSL

- Visual Studio Code - Remote – WSL
- Atom
- Sublime Text 3
- Any *nix Editor

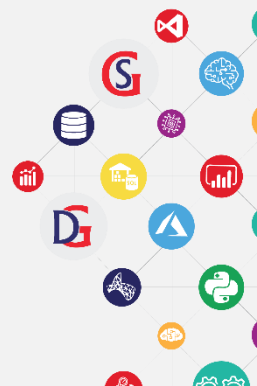
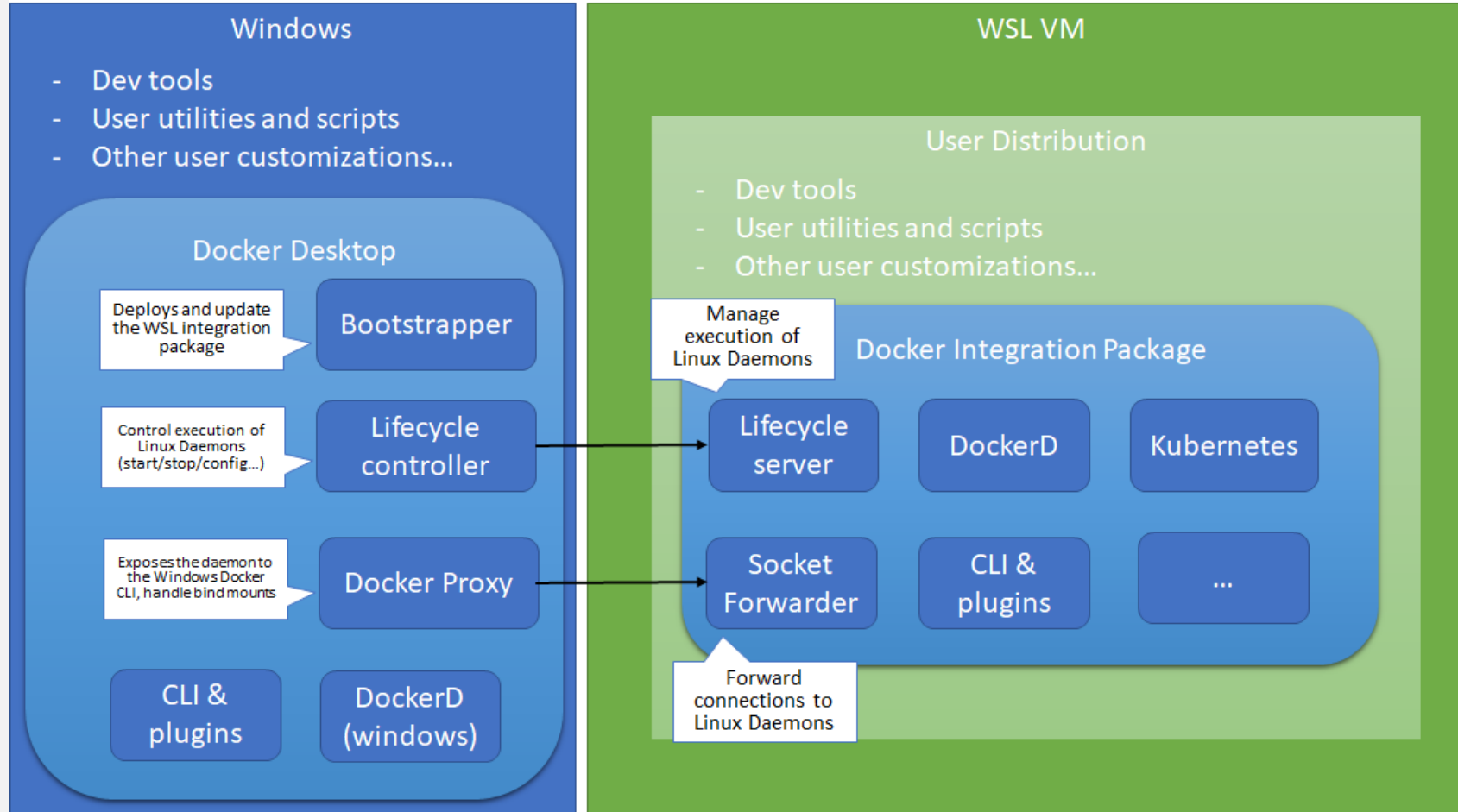
If your project requires cross-compilation using both Windows and Linux tools on the same files, use WSL v1 for now.



Docker Desktop Install with v2



Docker Desktop & WSL



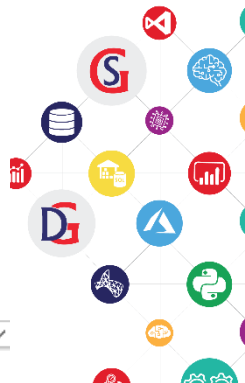
Kubernetes

```
mk8s on WSLNOMICRON - Virtual Machine Connection
File Action Media View Help
mk8s@mk8smaster: ~
mk8s@mk8smaster:~$ microk8s.kubectl create deployment microbot --image=dontrebootme/microbot:v1
deployment.apps/microbot created
mk8s@mk8smaster:~$ microk8s.kubectl get pods -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP            NODE       NOMINATED NODE   READINESS GATES
microbot-6d97548556-rscvv            1/1     Running   0          5s    10.1.56.108   mk8snode1   <none>           <none>
mk8s@mk8smaster:~$ microk8s.kubectl scale deployment microbot --replicas=5
deployment.apps/microbot scaled
mk8s@mk8smaster:~$ microk8s.kubectl get pods -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP            NODE       NOMINATED NODE   READINESS GATES
microbot-6d97548556-69jsl            1/1     Running   0          6s    10.1.56.109   mk8snode1   <none>           <none>
microbot-6d97548556-6qfg4            1/1     Running   0          6s    10.1.56.143   mk8smaster  <none>           <none>
microbot-6d97548556-gmc9n            1/1     Running   0          6s    10.1.56.142   mk8smaster  <none>           <none>
microbot-6d97548556-h7cnc            1/1     Running   0          6s    10.1.56.104   mk8snode2   <none>           <none>
microbot-6d97548556-rscvv            1/1     Running   0          21s   10.1.56.108   mk8snode1   <none>           <none>
mk8s@mk8smaster:~$ microk8s.kubectl delete pod/microbot-6d97548556-6qfg4
pod "microbot-6d97548556-6qfg4" deleted
mk8s@mk8smaster:~$ microk8s.kubectl get pods -o wide
NAME                                READY   STATUS    RESTARTS   AGE   IP            NODE       NOMINATED NODE   READINESS GATES
microbot-6d97548556-69jsl            1/1     Running   0          72s   10.1.56.109   mk8snode1   <none>           <none>
microbot-6d97548556-gmc9n            1/1     Running   0          72s   10.1.56.142   mk8smaster  <none>           <none>
microbot-6d97548556-gn89j            1/1     Running   0          47s   10.1.56.105   mk8snode2   <none>           <none>
microbot-6d97548556-h7cnc            1/1     Running   0          72s   10.1.56.104   mk8snode2   <none>           <none>
microbot-6d97548556-rscvv            1/1     Running   0          87s   10.1.56.108   mk8snode1   <none>           <none>
mk8s@mk8smaster:~$ microk8s.kubectl expose deployment microbot --type=LoadBalancer --port 80 --name=microbot-service
service/microbot-service exposed
mk8s@mk8smaster:~$ microk8s.kubectl get services
NAME             TYPE          CLUSTER-IP   EXTERNAL-IP   PORT(S)          AGE
kubernetes       ClusterIP     10.152.183.1 <none>        443/TCP          18h
microbot-service LoadBalancer  10.152.183.181 80.0.0.101    80:30539/TCP    11s
mk8s@mk8smaster:~$
```

localhost:30539

localhost:30539

Container hostname: microbot-6d97548556-rscvv



Things To Know

- permissions
- paths “\ or /” & CaSe
- wslpath
- .wslconfig
- /etc/wsl.conf
- WSLENV (17063+)
- Server install is different
- LxssManager service
- wsl command line
- hcsdiag
- Custom Distros/MS kernel available
- Wslutilities (Patrick Wu)



Resources

MS Docs - <https://docs.microsoft.com/en-us/windows/wsl/>

Github Repo/Issues - <https://github.com/microsoft/WSL>

Ubuntu WSL - <https://ubuntu.com/wsl>

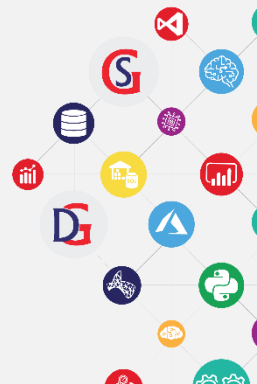
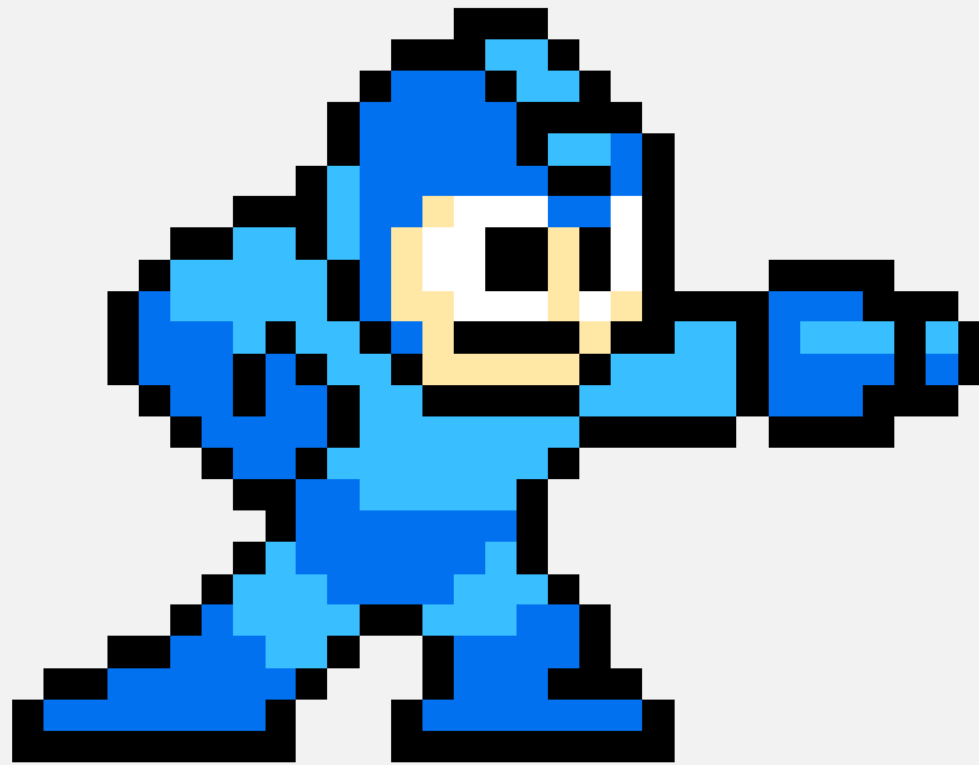
Brian Ketelsen - <https://wsl.dev/posts/>

Hayden Barnes - <https://github.com/sirredbeard/Awesome-WSL>

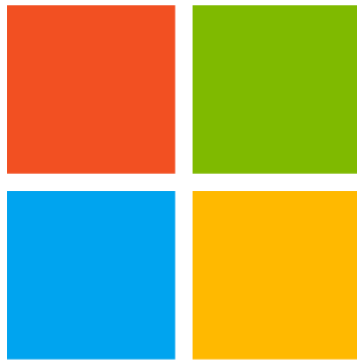
Patrick Wu - <https://patrickwu.space/#>



Demos



Special Thanks To



Microsoft

**for supporting
DataPlatformGeeks & SQLServerGeeks
Community Initiatives**



Thank You

Three Ways to Win Prizes

Post your selfie with hash tag **#DPS2020**

Give Session & Conference Feedback

Visit our Sponsors & Exhibitors

Follow us on Twitter **@TheDataGeeks @DataAISummit**

