# Docker

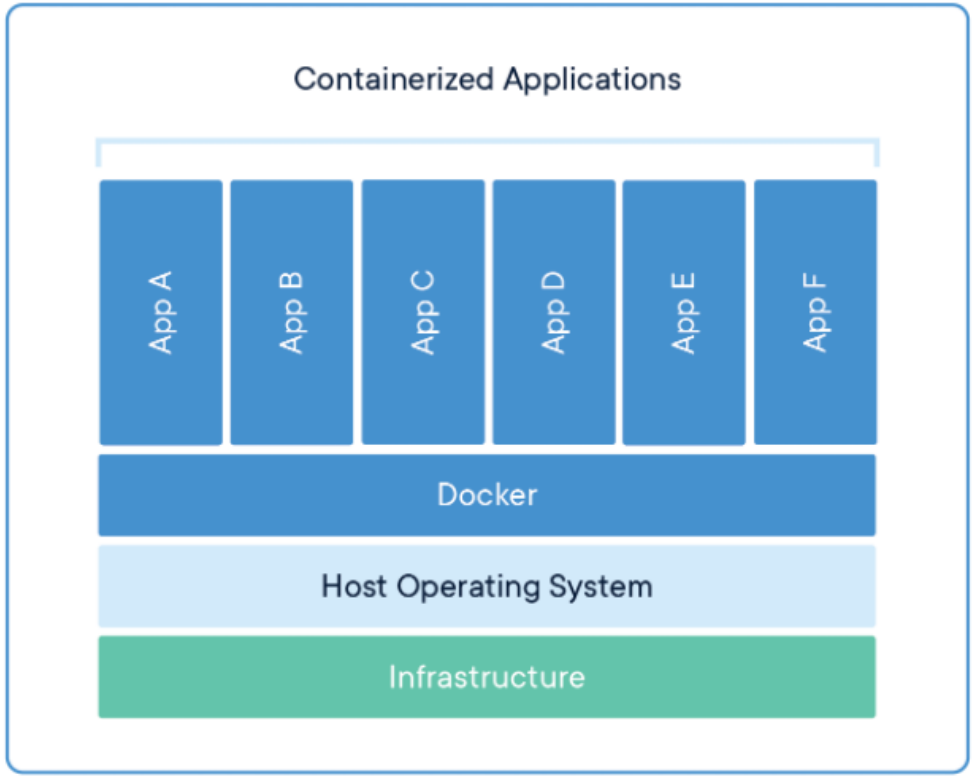
Introduction

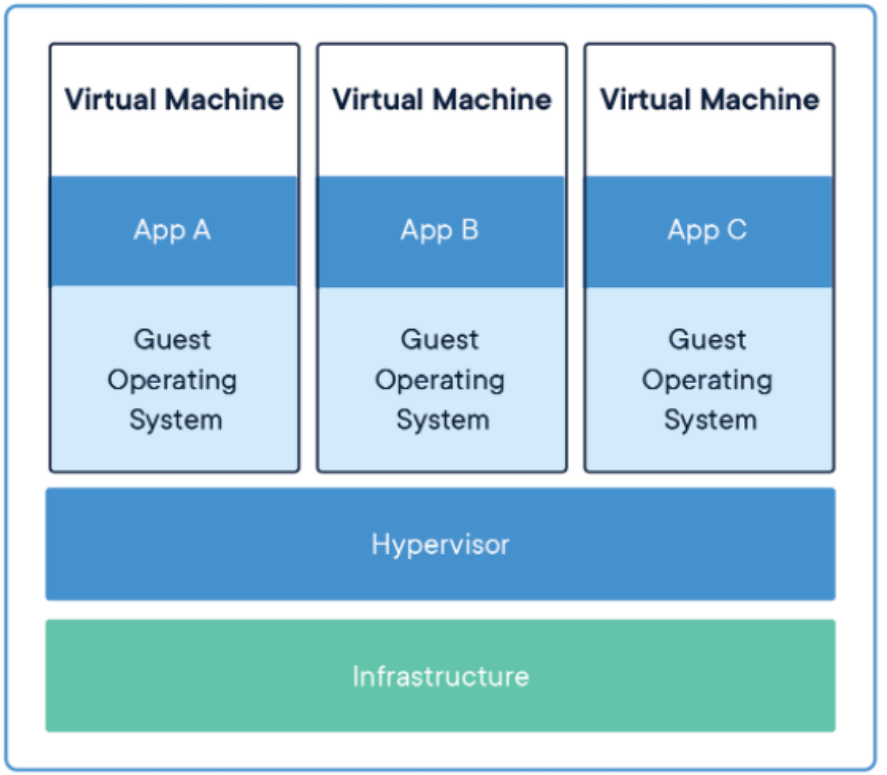
# Docker

vs

Virtual Machine

# Docker Containers vs. VMs




The containerized apps share the hosts' operating system via Docker...

Very fast bootup times, so you can do single functions now...

## Docker Containers

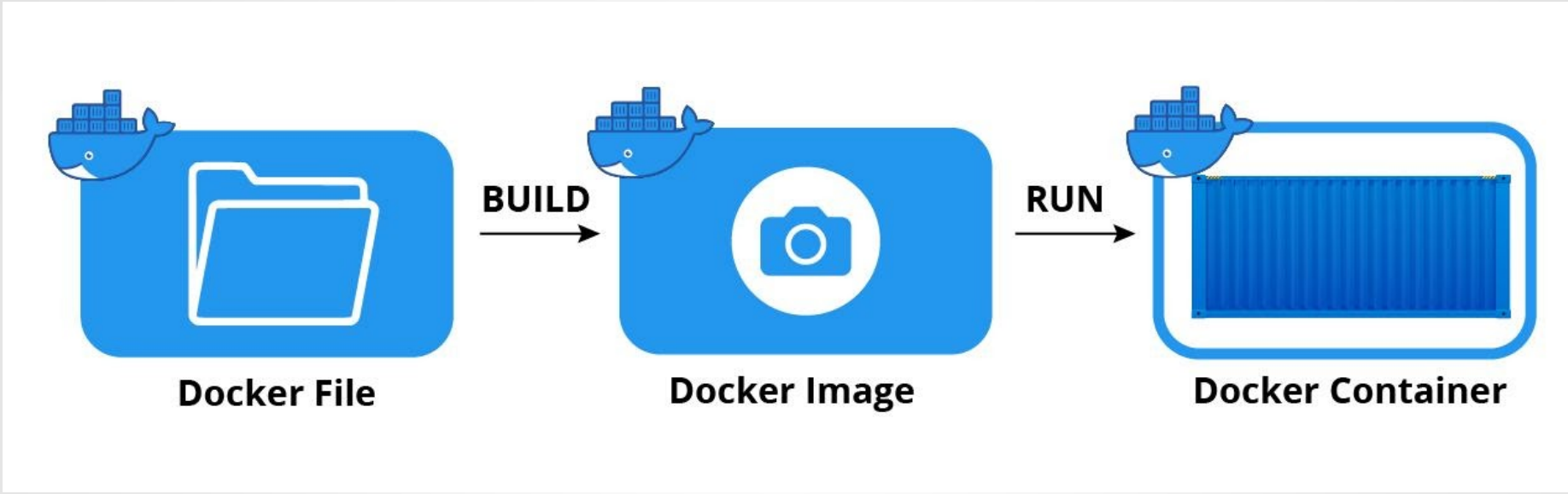
Share the hosts' operating system via an abstraction layer (so no need to boot up a Linux to run a container)

Work on all operating systems.

Can run Windows containers on Windows systems

Are the reason why MS has integrated Linux into their operating system.

# Dockerfile - Image - Container



# Linux

on Windows

# Windows Subsystem for Linux (WSL)

MS wants Windows users to be able to run Linux-based Docker containers.

You need a Linux host operating system for that.

They integrated a full Linux kernel into Windows

# WSL2

You can:

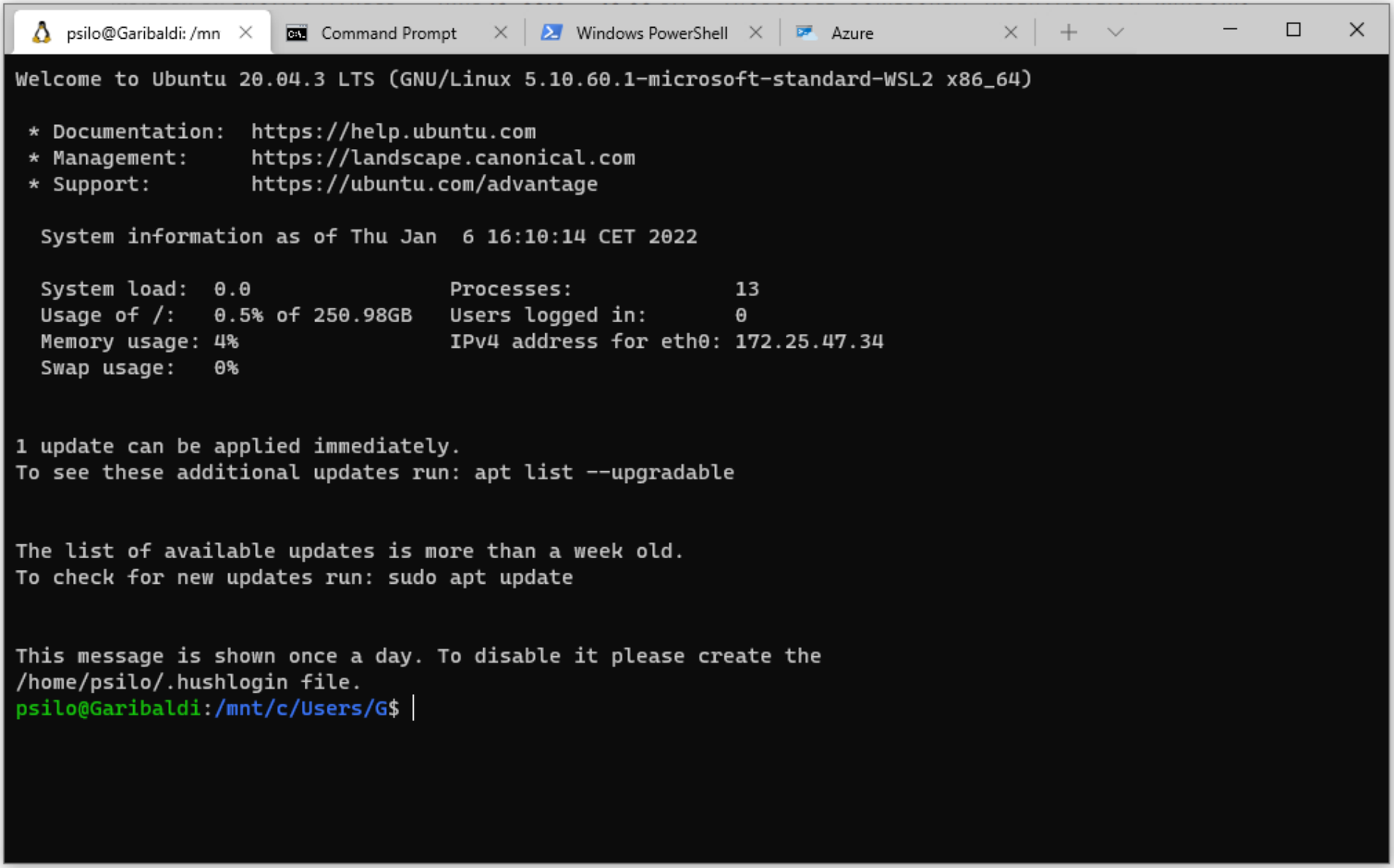
- Choose your favorite GNU/Linux distributions from the Microsoft Store.
- Run common command-line tools such as grep, sed, awk, or other ELF-64 binaries.
- Run Bash shell scripts and GNU/Linux command-line applications including:
  - Tools: vim, emacs, tmux
  - Languages: NodeJS, Javascript, Python, Ruby, C/C++, C# & F#, Rust, Go, etc.
  - Services: SSHD, MySQL, Apache, lighttpd, MongoDB, PostgreSQL.
- Install additional software using your own GNU/Linux distribution package manager.
- Invoke Windows applications using a Unix-like command-line shell.
- Invoke GNU/Linux applications on Windows.

# WSL1 / WSL2

## Comparing features

| Feature | WSL 1 | WSL 2 |
| --- | --- | --- |
| Integration between Windows and Linux | ✅ | ✅ |
| Fast boot times | ✅ | ✅ |
| Small resource foot print compared to traditional Virtual Machines | ✅ | ✅ |
| Runs with current versions of VMware and VirtualBox | ✅ | ✅ |
| Managed VM | ❌ | ✅ |
| Full Linux Kernel | ❌ | ✅ |
| Full system call compatibility | ❌ | ✅ |
| Performance across OS file systems | ✅ | ❌ |

# Windows Terminal


psilo@Garibaldi: /mn
Command Prompt
Windows PowerShell
Azure
Welcome to Ubuntu 20.04.3 LTS (GNU/Linux 5.10.60.1-microsoft-standard-WSL2 x86_64)
* Documentation: https://help.ubuntu.com
* Management: https://landscape.canonical.com
* Support: https://ubuntu.com/advantage
System information as of Thu Jan 6 16:10:14 CET 2022
System load: 0.0
Usage of /: 0.5% of 250.98GB
Memory usage: 4%
Swap usage: 0%
Processes: 13
Users logged in: 0
IPv4 address for eth0: 172.25.47.34
1 update can be applied immediately.
To see these additional updates run: apt list --upgradable
The list of available updates is more than a week old.
To check for new updates run: sudo apt update
This message is shown once a day. To disable it please create the
/home/psilo/.hushlogin file.
psilo@Garibaldi:/mnt/c/Users/G$

# A real terminal on Windows

Use it for starting sessions for:

Powershell

CMD

Your favorite Linux distribution

https://www.microsoft.com/en-us/p/windows-terminal/9n0dx20hk701?activetab=pivot:overviewtab

# Docker

Dockerfile

(build an image)

# Dockerfile Example 1

```
FROM ubuntu

MAINTAINER ARSTECH arstech@e-mail

RUN apt-get update && apt-get upgrade -y
RUN apt-get install -y apt-utils htop

CMD ["echo","It's my Docker Image "]
```

# Dockerfile Example 2

```
1   # fetch node v4 LTS codename argon
2   FROM node:argon
3
4   # Request samplename build argument
5   ARG samplename
6
7   # Create app directory
8   RUN mkdir -p /usr/src/spfx-samples
9   WORKDIR /usr/src/spfx-samples
10
11  #Install app dependencies
12  RUN git clone https://github.com/SharePoint/sp-dev-fx-webparts.git .
13  WORKDIR /usr/src/spfx-samples/samples/$samplename
14
15  # install gulp on a global scope
16  RUN npm install gulp -g
17
18  # RUN ["npm", "install", "gulp"]
19  RUN npm install
20  RUN npm cache clean
21
22  # Expose required ports
23  EXPOSE 4321 35729 5432
24
25  # Run sample
26  CMD ["gulp", "serve"]
27
```

# Dockerfile Example 3

## Multi-stage builds to remove build deps

```
FROM maven:3.6-jdk-8-alpine AS builder
WORKDIR /app
COPY pom.xml .
RUN mvn -e -B dependency:resolve
COPY src ./src
RUN mvn -e -B package

FROM openjdk:8-jre-alpine
COPY --from=builder /app/target/app.jar /
CMD ["java", "-jar", "/app.jar"]
```

# Docker

Getting Started...

download...

https://www.docker.com/get-started

hands-on...

https://docs.docker.com/get-started/