

FIAP GRADUAÇÃO

SISTEMAS DE INFORMAÇÃO

MICROSERVICE AND WEB ENGINEERING

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■ Agenda

- Finalizar o projeto produto-mvc
- Iniciando com Docker

Objetivos

- Finalizar o projeto produto-mvc – baixar projeto da aula 22.
- Criar ProdutoDTO.
- Refatorar ProdutoService, ProdutoController e as Views de Produto.
- Iniciar com Docker

Refatorar class LojaService

```
LojaService.java x
34 @Transactional
35 public LojaDTO insert(LojaDTO dto){
36     Loja entity = new Loja();
37     copyDtoToEntity(dto, entity);
38     entity = repository.save(entity);
39     return new LojaDTO(entity);
40 }
41
42 @Transactional
43 public LojaDTO update(Long id, LojaDTO dto){
44     try{
45         Loja loja = repository.getReferenceById(id);
46         // loja.setNome(dto.getNome());
47         copyDtoToEntity(dto, loja);
48         loja = repository.save(loja);
49         return new LojaDTO(loja);
50     } catch (EntityNotFoundException e){
51         throw new IllegalArgumentException("Recurso não encontrado");
52     }
53 }
54
55 @private void copyDtoToEntity(LojaDTO dto, Loja entity) {
56     entity.setNome(dto.getNome());
57 }
```

class ProdutoDTO

```
ProdutoDTO.java x
18 @AllArgsConstructor
19 @NoArgsConstructor
20 @Getter
21 @Setter
22 public class ProdutoDTO {
23     private Long id;
24     @NotBlank(message = "Campo requerido")
25     @Size(min = 3, message = "O nome deve ter no mínimo 3 caracteres")
26     private String nome;
27     @NotBlank(message = "Campo requerido")
28     private String descricao;
29     @NotNull(message = "Campo requerido")
30     @Positive(message = "O valor deve ser positivo")
31     private Double valor;
32     private Categoria categoria;
33     private List<Loja> lojas = new ArrayList<>();
34
35     @ public ProdutoDTO(Produto entity) {
36         id = entity.getId();
37         nome = entity.getNome();
38         descricao = entity.getDescricao();
39         valor = entity.getValor();
40         categoria = entity.getCategoria();
41         for(Loja loja : entity.getLojas()){
42             lojas.add(loja);
43         }
44     }
```

Refatorar class ProdutoService

```
ProdutoDTO.java x ProdutoService.java x
16 @Service
17 public class ProdutoService {
18
19     @Autowired
20     private ProdutoRepository repository;
21
22     @Autowired
23     private LojaRepository lojaRepository;
24
25     @Transactional(readOnly = true)
26     public List<ProdutoDTO> findAll() {
27         List<Produto> list = repository.findAll();
28         return list.stream().map(ProdutoDTO::new).collect(Collectors.toList());
29     }
30
31     @Transactional
32     public ProdutoDTO insert(ProdutoDTO dto) {
33         Produto entity = new Produto();
34         copyDtoToEntity(dto, entity);
35         entity = repository.save(entity);
36         return new ProdutoDTO(entity);
37     }
}
```

I Refatorar class ProdutoService

```
ProdutoDTO.java x ProdutoService.java x
39      @Transactional(readOnly = true)
40      public ProdutoDTO findById(Long id) {
41
42          Produto produto = repository.findById(id).orElseThrow(
43              () -> new IllegalArgumentException("Recurso inválido - " + id)
44          );
45          return new ProdutoDTO(produto);
46      }
47
48      @Transactional
49      public ProdutoDTO update(Long id, ProdutoDTO dto) {
50          try {
51              Produto produto = repository.getReferenceById(id);
52              copyDtoToEntity(dto, produto);
53              produto = repository.save(produto);
54              return new ProdutoDTO(produto);
55          } catch (EntityNotFoundException e) {
56              throw new IllegalArgumentException("Recurso não encontrado");
57          }
58      }
```


I Refatorar class ProdutoService

```
ProdutoDTO.java x ProdutoService.java x
60 @Transactional
61 public void delete(Long id) {
62     if (!repository.existsById(id)) {
63         throw new IllegalArgumentException("Produto inválido - id: " + id);
64     }
65     try {
66         repository.deleteById(id);
67     } catch (Exception e) {
68         throw new IllegalArgumentException("Produto inválido - id: " + id);
69     }
70 }
71
72 @private void copyDtoToEntity(ProdutoDTO dto, Produto entity) {
73     entity.setNome(dto.getNome());
74     entity.setDescricao(dto.getDescricao());
75     entity.setValor(dto.getValor());
76     entity.setCategoria(dto.getCategoria());
77
78     entity.getLojas().clear();
79     for(Loja item: dto.getLojas()){
80         //para colocar os dados completos da loja
81         Loja loja = lojaRepository.getReferenceById(item.getId());
82         entity.getLojas().add(loja);
83     }
84 }
```

Refatorar class ProdutoController

```
ProdutoController.java x
45 @GetMapping("/form")
46 @ public String loadForm(Model model) {
47     model.addAttribute("produtoDTO", new ProdutoDTO());
48     return "produto/novo-produto";
49 }
50
51 @PostMapping()
52 @ public String insert(@Valid ProdutoDTO produtoDTO,
53     BindingResult result,
54     RedirectAttributes attributes) {
55     if (result.hasErrors()) {
56         return "produto/novo-produto";
57     }
58     produtoDTO = service.insert(produtoDTO);
59     attributes.addFlashAttribute("mensagem", "Produto salvo com sucesso");
60     return "redirect:/produtos/form";
61 }
```

Refatorar class ProdutoController

```
ProdutoController.java x
63     @GetMapping()
64     @ public String findAll(Model model) {
65         model.addAttribute("produtos", service.findAll());
66         return "/produto/listar-produtos";
67     }
68
69     @GetMapping("/{id}")
70     @ public String findById(@PathVariable("id") Long id, Model model) {
71         ProdutoDTO produtoDTO = service.findById(id);
72         model.addAttribute("produtoDTO", produtoDTO);
73         return "/produto/editar-produto";
74     }
```

Refatorar class ProdutoController

```
ProdutoController.java x
76     @PutMapping("/{id}")
77     @
78     public String update(@PathVariable("id") Long id,
79                          @Valid ProdutoDTO produtoDTO,
80                          BindingResult result) {
81         if (result.hasErrors()) {
82             produtoDTO.setId(id);
83             return "/produto/editar-produto";
84         }
85         service.update(id, produtoDTO);
86         return "redirect:/produtos";
87     }
88
89     @DeleteMapping("/{id}")
90     public String delete(@PathVariable("id") Long id, Model model) {
91         service.delete(id);
92         return "redirect:/produtos";
93     }
```

Refatorar novo-produto.html

```
20 </div>
21
22 <form action="#" method="post" th:action="@{/produtos}" th:object="${produtoDTO}">
23
24 <div class="row mb-3">
```

```
68 <div class="col-sm-5">
69 <select class="chosen-select form-control" data-placeholder="lojas" id="lojas" multi
70 name="lojas" th:field="${produtoDTO.lojas}">
71 <option th:each="loja : ${lojas}"
72 th:text="${loja.nome}"
73 th:value="${loja.id}"/>
74 </select>
75 </div>
```

Testar aplicação

FIAP Home Categoria ▾ Produto ▾

Lista de Produtos

Nome	Descrição	Categoria	Lojas	Valor	Ações	
Mouse Microsoft	Mouse sem fio	Mouse	Americanas , Magazine Luiza	250.0	Excluir	Editar
Smartphone Samsung Galaxy A54 5G	Samsung Galaxy A54 5G	Smartphone	Americanas , Submarino	1799.0	Excluir	Editar
Smart TV	Smart TV LG LED 65 polegadas	Smart TV	Fast Shop	3999.0	Excluir	Editar
Teclado Microsof	Teclado sem fio	Teclado	Fast Shop	278.5	Excluir	Editar
Apple iPhone 15	Apple iPhone 15, 128G, Preto	Smartphone	Fast Shop	4999.0	Excluir	Editar

Testar aplicação

Cadastro de Produtos

Nome: O nome deve ter no mínimo 3 caracteres
Campo requerido

Descrição: Campo requerido

Categoria:

Lojas:
Fast Shop
Magazine Luiza
Submarino

Valor: Campo requerido

Salvar

Cadastro de Produtos

Nome:

Descrição: C

Categoria:

Lojas:
Fast Shop
Magazine Luiza
Submarino

Valor: Campo requerido

Salvar

Lista de Produtos

Nome	Descrição	Categoria	Lojas	Valor	Ações	
Mouse Microsoft	Mouse sem fio	Mouse	Americanas , Magazine Luiza	250.0	Excluir	Editar
Smartphone Samsung Galaxy A54 5G	Samsung Galaxy A54 5G	Smartphone	Americanas , Submarino	1799.0	Excluir	Editar
Smart TV	Smart TV LG LED 65 polegadas	Smart TV	Fast Shop	3999.0	Excluir	Editar
Teclado Microsof	Teclado sem fio	Teclado	Fast Shop	278.5	Excluir	Editar
Apple iPhone 15	Apple iPhone 15, 128G, Preto	Smartphone	Fast Shop	4999.0	Excluir	Editar
Teste	Teste	Tablet	Fast Shop , Magazine Luiza	121.0	Excluir	Editar

Refatorar editar-produto.html

```
editar-produto.html x
18 </div>
19
20 <form action="#" th:action="@{/produtos/{id}(id=${produtoDTO.id})}" th:object="${produtoDTO}" method="post">
21   <input type="hidden" name="_method" value="put">
22   <div class="row mb-3">
```

```
editar-produto.html x
65 <div class="col-sm-3">
66   <select class="chosen-select form-control" data-placeholder="lojas" id="lojas" mul
67     name="lojas" th:field="${produtoDTO.lojas}">
68     <option th:each="loja :${lojas}"
69       th:text="${loja.nome}"
70       th:value="${loja.id}"/>
```


Testar aplicação

Alteração de Produto

Nome:

Descrição:

Categoria:

Lojas:

Americanas

Fast Shop

Magazine Luiza

Submarino

Valor:

Alterar

Alteração de Produto

Nome:

Descrição:

Categoria:

Lojas:

Americanas

Fast Shop

Magazine Luiza

Submarino

Valor:

Alterar

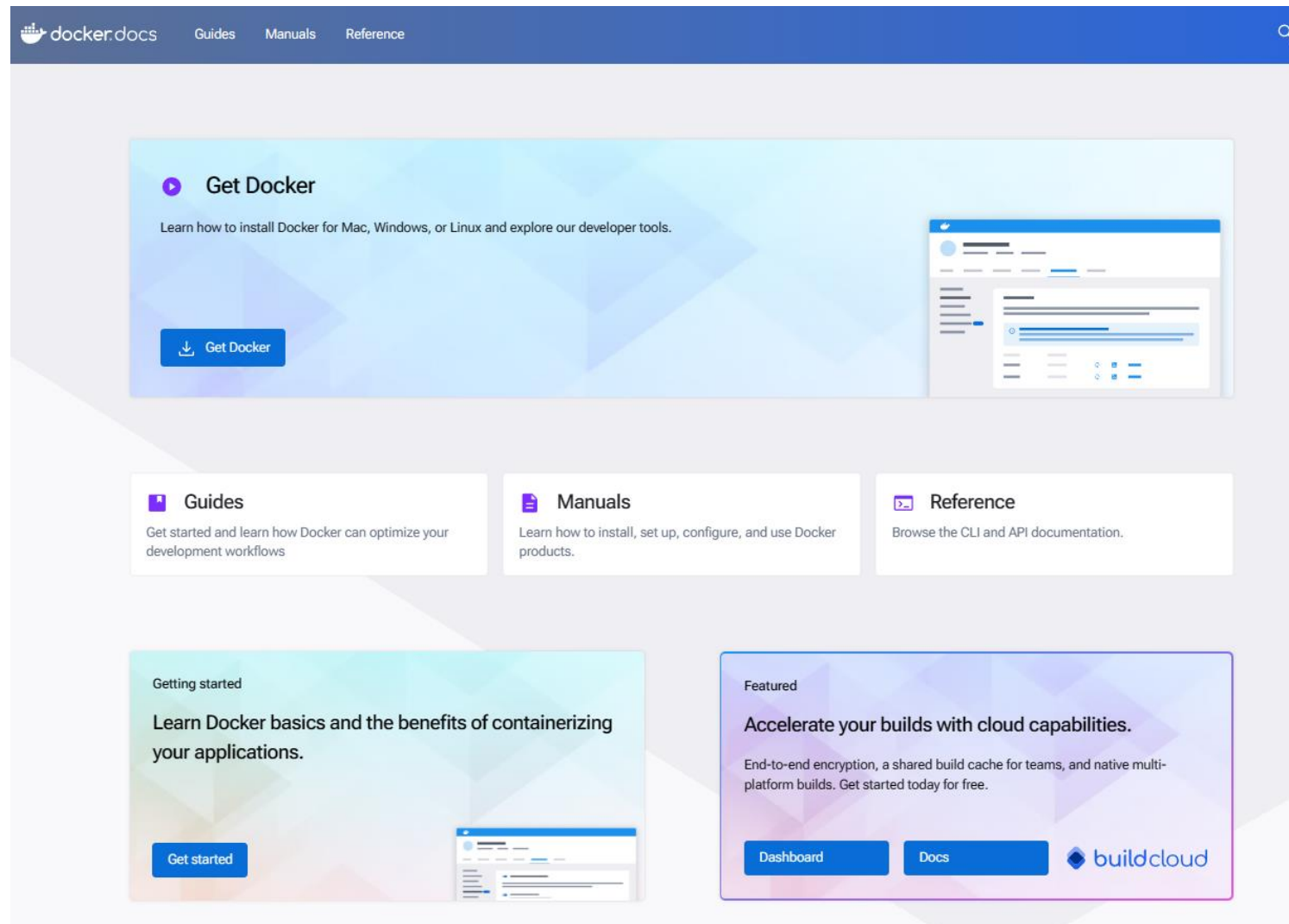
Testar Excluir todos

Lista de Produtos

Nome	Descrição	Categoria	Lojas	Valor	Ações	
Mouse Microsoft	Mouse sem fio	Mouse	Americanas , Magazine Luiza	250.0	<button>Excluir</button>	<button>Editar</button>
Smartphone Samsung Galaxy A54 5G	Samsung Galaxy A54 5G	Smartphone	Americanas , Submarino	1799.0	<button>Excluir</button>	<button>Editar</button>
Smart TV	Smart TV LG LED 65 polegadas	Smart TV	Fast Shop	3999.0	<button>Excluir</button>	<button>Editar</button>
Teclado Microsof	Teclado sem fio	Teclado	Fast Shop	278.5	<button>Excluir</button>	<button>Editar</button>
Apple iPhone 15	Apple iPhone 15, 128G, Preto	Smartphone	Fast Shop	4999.0	<button>Excluir</button>	<button>Editar</button>
Teste Update	Teste	Smartphone	Americanas	1221.0	<button>Excluir</button>	<button>Editar</button>



Docker



<https://docs.docker.com/>

The screenshot shows the Docker website's 'Get Started' page. At the top, there's a dark blue navigation bar with links for 'Docs', 'Get support', and 'Contact sales'. Below this is a white header with the Docker logo, navigation links for 'Products', 'Developers', 'Pricing', 'Support', 'Blog', and 'Company', a search icon, and buttons for 'Sign In' and 'Get Started'. The main content area has a large heading 'Get Started with Docker' followed by the subtext 'Build applications faster and more securely with Docker for developers'. Below this are two buttons: 'Learn how to install Docker' and 'Download for Windows'. Further down is another heading 'An experience you'll love' with the subtext 'Customize your development experience with tools that enhance your tech stack and optimize your development process.' At the bottom, there are two blue boxes. The left box is titled 'AI/ML' and features an icon of a head with a gear inside, surrounded by stars and dots. The right box is titled 'CLI' and features an icon of a terminal window with a right arrow and a minus sign, also surrounded by stars and dots.

Docs Get support Contact sales

docker Products Developers Pricing Support Blog Company Sign In Get Started

Get Started with Docker

Build applications faster and more securely with Docker for developers

Learn how to install Docker Download for Windows

An experience you'll love

Customize your development experience with tools that enhance your tech stack and optimize your development process.

AI/ML

For more than a decade, developers have relied on Docker to accelerate the setup and deployment of their development environments. Docker provides these same benefits for building modern AI/ML applications — where the

CLI

Prefer using the command line? The Docker CLI is here to elevate your development experience. Seamlessly manage containers, images, and networks using straightforward commands tailored for CLI aficionados. Get

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

AULA 23 – Docker – parte 1



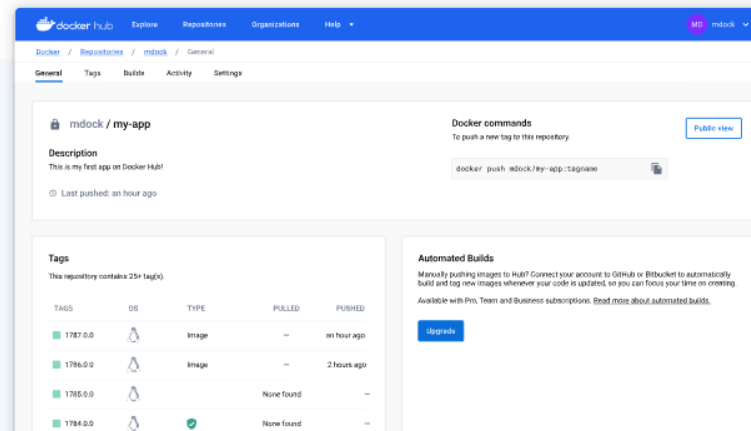
Docker Hub

The world's largest container registry

Discover, share, and integrate container images

Explore Docker Hub

Create a Hub account



<https://www.docker.com/products/docker-hub/>

AULA 23 – Docker – parte 1

Docker Hub

Develop faster. Run anywhere.

Docker Hub is the world's easiest way to create, manage, and deliver your team's container applications.

Search Docker Hub ctrl+K

Spotlight

CLOUD DEVELOPMENT

Build up to 39x faster with Docker Build Cloud

Introducing Docker Build Cloud: A new solution to speed up build times and improve developer productivity

AI/ML DEVELOPMENT

LLM Everywhere: Docker and Hugging Face

Set up a local development environment for Hugging Face with Docker

SOFTWARE SUPPLY CHAIN

Take action on prioritized insights

Bridge the gap between development workflows and security needs

AI and Machine Learning

tensorflow/tensorflow

Official Docker images for the machine learning framework TensorFlow...

☆ 2.4K ± 50M+

pytorch/pytorch

PyTorch is a deep learning framework that puts Python first.

☆ 978 ± 10M+

langchain/langchain

Building applications with LLMs through composability

☆ 87 ± 10K+

ollama/ollama

The easiest way to get up and running with large language models.

☆ 407 ± 1M+

Trending this week

homeassistant/amd64-a...

paketobuildpacks/build


vitess/lite

friendica

<https://hub.docker.com/>


AULA 23 – Docker – parte 1

Docker Hub



Create your account


We suggest signing up with your work email address.




☐ Send me occasional product updates and announcements.


Sign up

OR

 Continue with Google

 Continue with GitHub

[Already have an account? Sign in](#)




Sign in


Using Docker for work? We recommend signing in with your work email address.

Username or email address*

Continue

OR

 Continue with Google

 Continue with GitHub

<https://hub.docker.com/signup>

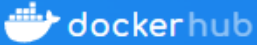
AULA 23 – Docker – parte 1

Atividade

- Criar uma conta no Docker hub caso ainda não tenha.

Docker Hub

FIAP

 Explore Repositories Organizations

Search Docker Hub ctrl+K ? ⌵ A

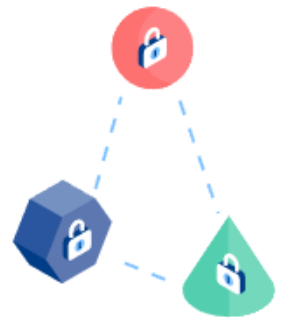
acrdev

Search by repository name

All Content

Create repository

<div>acrdev / pedidos-ms</div> <div>Contains: Image • Last pushed: 5 months ago</div>	<div>Security unknown</div>	<div>☆ 0</div>	<div>1</div>	<div>Public</div>
<div>acrdev / fiap_page</div> <div>Contains: Image • Last pushed: 5 months ago</div>	<div>Security unknown</div>	<div>☆ 0</div>	<div>2</div>	<div>Public</div>
<div>acrdev / getting-started</div> <div>Contains: Image • Last pushed: 6 months ago</div>	<div>Security unknown</div>	<div>☆ 0</div>	<div>3</div>	<div>Public</div>




Create An Organization

Docker Hub

The screenshot shows the Docker Hub interface with the 'Explore' tab selected. The search bar contains 'Search Docker Hub'. The left sidebar shows filters for Products (Images, Extensions, Plugins), Trusted Content (Docker Official Image, Verified Publisher, Sponsored OSS), Operating Systems (Linux, Windows), and Architectures (ARM, ARM 64, IBM POWER, IBM Z, PowerPC 64 LE, x86). The main content area displays search results for 'memcached', 'redis', 'alpine', and 'nginx'. Each result includes the image icon, name, update time, description, supported architectures, and pull statistics.

Image Name	Updated	Description	Architectures	Pulls (Last week)
memcached	Updated 21 days ago	Free & open source, high-performance, distributed memory object caching system.	Linux, unknown, 386, ARM 64, mips64le, PowerPC 64 LE, IBM Z, unknown, x86-64, ARM	116,271,305
redis	Updated 21 days ago	Redis is an open source key-value store that functions as a data structure server.	Linux, unknown, Windows, 386, unknown, IBM Z, x86-64, ARM, ARM 64, mips64le, PowerPC 64 LE	42,251,872
alpine	Updated a month ago	A minimal Docker image based on Alpine Linux with a complete package index and only 5 MB in size!	Linux, 386, ARM 64, PowerPC 64 LE, IBM Z, riscv64, x86-64, ARM	9,244,452
nginx	Updated 20 days ago	Official build of Nginx.		71,109,140

 **dockerhub**


ExploreRepositoriesOrganizations




Search Docker Hub

ctrl+K?

A

Explore / Official Images / ubuntu



ubuntu  Docker Official Image ·  1B+ ·  10K+

Ubuntu is a Debian-based Linux operating system based on free software.

docker pull ubuntu

Copy

OverviewTags

Quick reference

- Maintained by:
Canonical
- Where to get help:
the Docker Community Slack, Server Fault, Unix & Linux, or Stack Overflow

Supported tags and respective Dockerfile links

- 20.04, focal-20240427, focal
- 22.04, jammy-20240427, jammy
- 23.10, mantic-20240427, mantic
- 24.04, noble-20240429, noble, latest, rolling

Quick reference (cont.)

Recent Tags

rolling noble-20240429 noble mantic-20240427

mantic latest jammy-20240427 jammy

focal-20240427 focal

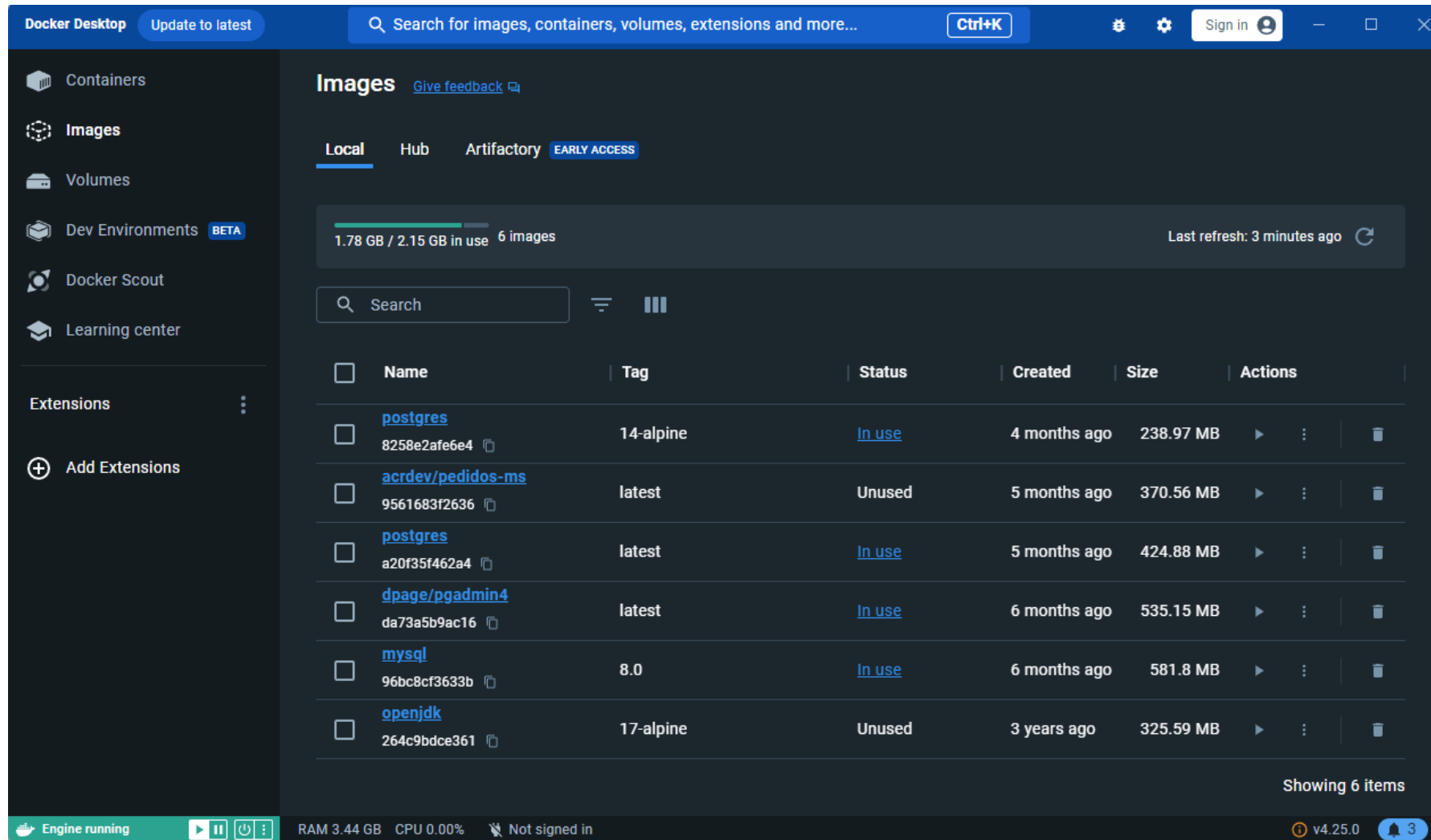
About Official Images

Docker Official Images are a curated set of Docker open source and drop-in solution repositories.

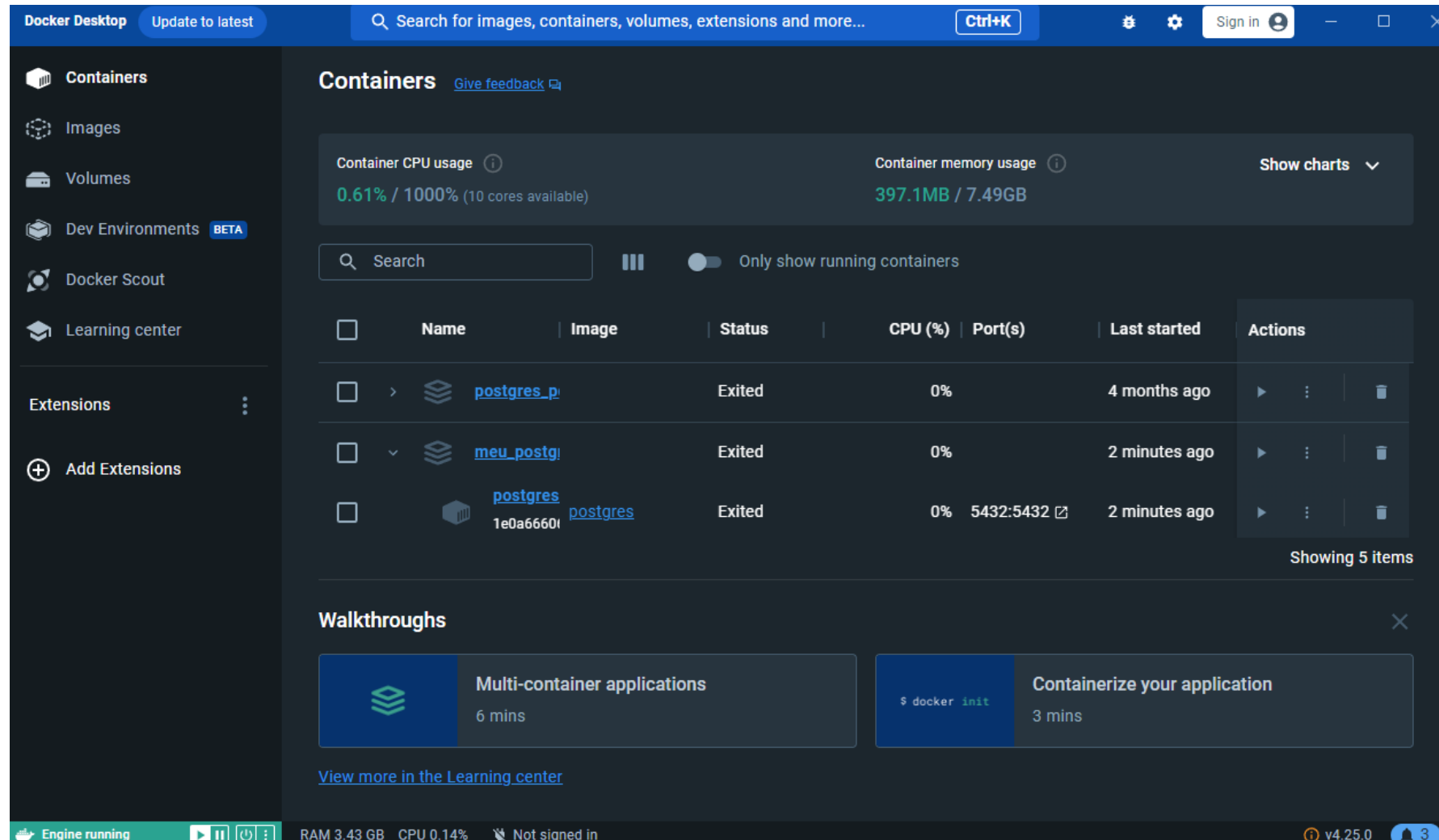
Why Official Images?

These images have clear documentation, promote best practices, and are designed for the most common use cases.

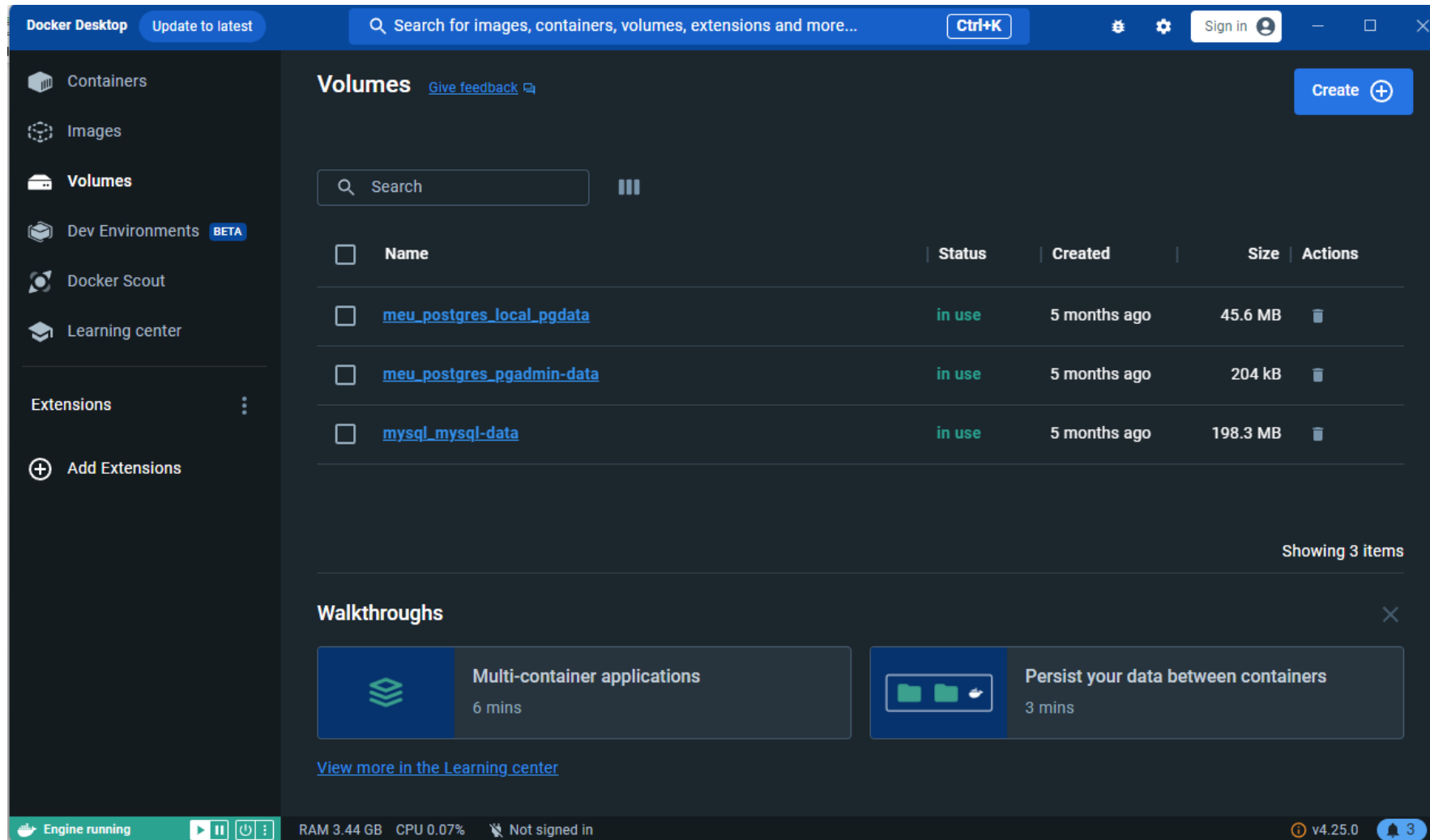
Docker Desktop - Windows



Docker Desktop - Windows



Docker Desktop - Windows



Docker – Referência

The screenshot shows the Docker documentation page for the `docker container run` command. The page is titled "docker container run" and includes a description, usage, aliases, and a table of options.

Reference documentation

- CLI reference
 - docker (base command)
 - docker build
 - docker builder
 - docker buildx
 - docker checkpoint
 - docker compose
 - docker config
 - docker container
 - docker container
 - docker container attach
 - docker container commit
 - docker container cp
 - docker container create
 - docker container diff
 - docker container exec
 - docker container export
 - docker container inspect
 - docker container kill
 - docker container logs
 - docker container ls
 - docker container pause
 - docker container port
 - docker container prune
 - docker container rename

docker container run

Description Create and run a new container from an image

Usage `docker container run [OPTIONS] IMAGE [COMMAND] [ARG...]`

Aliases `docker run`

Description

The `docker run` command runs a command in a new container, pulling the image if needed and starting the container.

You can restart a stopped container with all its previous changes intact using `docker start`. Use `docker ps -a` to view a list of all containers, including those that are stopped.

Options

Option	Default	Description
<code>--add-host</code>		Add a custom host-to-IP mapping (host:ip)
<code>--annotation</code>	API 1.43	Add an annotation to the container (passed through to the OCI runtime)
<code>-a, --attach</code>		Attach to STDIN, STDOUT or STDERR
<code>--blkio-weight</code>		Block IO (relative weight), between 10 and 1000, or 0 to disable (default 0)
<code>--blkio-weight-device</code>		Block IO weight (relative device weight)
<code>--cap-add</code>		Add Linux capabilities
<code>--cap-drop</code>		Drop Linux capabilities
<code>--cgroup-parent</code>		Optional parent cgroup for the container

Table of contents

- Description
- Options
- Examples
 - Assign name (`--name`)
 - Capture container ID (`--cidfile`)
 - PID settings (`--pid`)
 - Example: run http inside a container
 - Example, join another container's PID namespace
 - Disable namespace remapping for a container (`--users`)
 - UTS settings (`--uts`)
 - IPC settings (`--ipc`)
 - Escalate container privileges (`--privileged`)
 - Set working directory (`-w, --workdir`)
 - Set storage driver options per container (`--storage-opt`)
 - Mount tmpfs (`--tmpfs`)
 - Mount volume (`-v`)
 - Mount volume read-only (`--read-only`)
 - Add bind mounts or volumes using the `--mount` flag
 - Publish or expose port (`-p, --expose`)
 - Publish all exposed ports (`-P, --publish-all`)
 - Set the pull policy (`--pull`)
 - Set environment variables (`-e, --env, --env-file`)
 - Set metadata on container (`-l, --label, --label-file`)
 - Connect a container to a network (`--network`)
 - Mount volumes from container (`--volumes-from`)
 - Detached mode (`-d, --detach`)
 - Override the detach sequence (`--detach-keys`)
 - Add host device to container (`--device`)
 - CDI devices
 - Attach to STDIN/STDOUT/STDERR (`-a, --attach`)
 - Keep STDIN open (`-i, --interactive`)

<https://docs.docker.com/reference/cli/docker/container/run/>

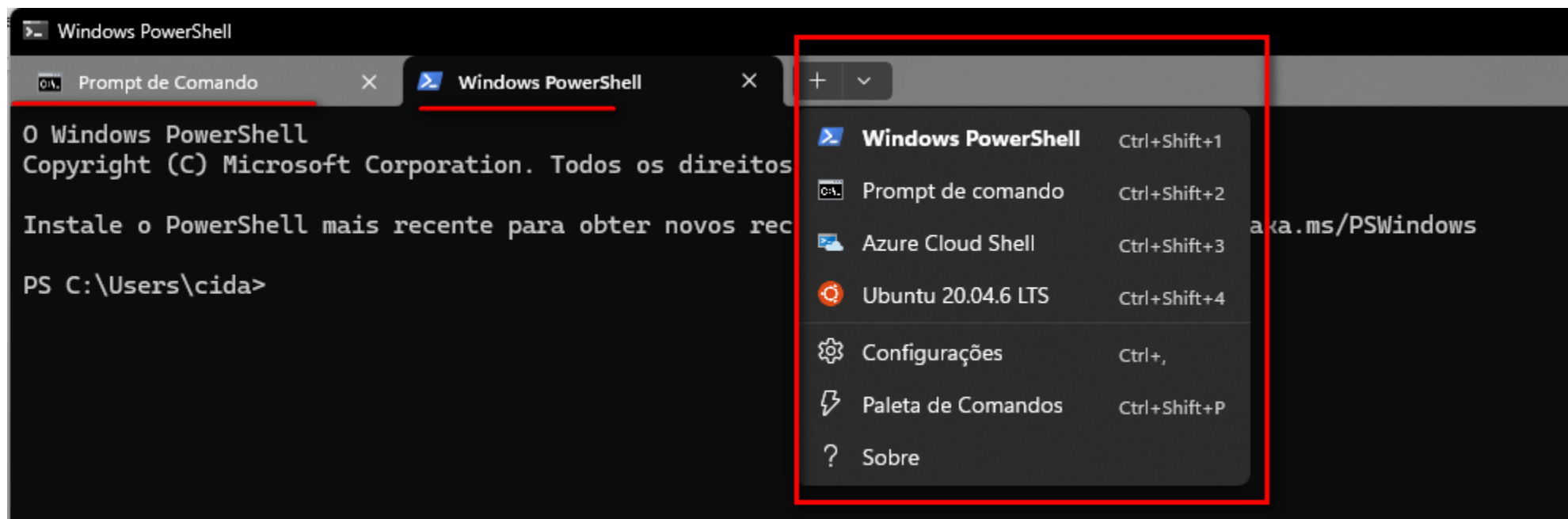
AULA 23 – Docker – parte 1

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I Docker Instalações

- <https://docs.docker.com/manuals/>
- <https://docs.docker.com/desktop/>
- <https://learn.microsoft.com/pt-br/windows/wsl/install-manual#step-2---check-requirements-for-running-wsl-2>
- <https://learn.microsoft.com/pt-br/windows/wsl/setup/environment>

WSL – Ubuntu no Windows



Docker – VSCode extensions



Dev Containers

Open any folder or repository inside a Docker container and take advantage of Visual Studio Code's full feature set.



Microsoft



Docker

Makes it easy to create, manage, and debug containerized applications.



Microsoft



WSL

Open any folder in the Windows Subsystem for Linux (WSL) and take advantage of Visual Studio Code's full feature set.



Microsoft

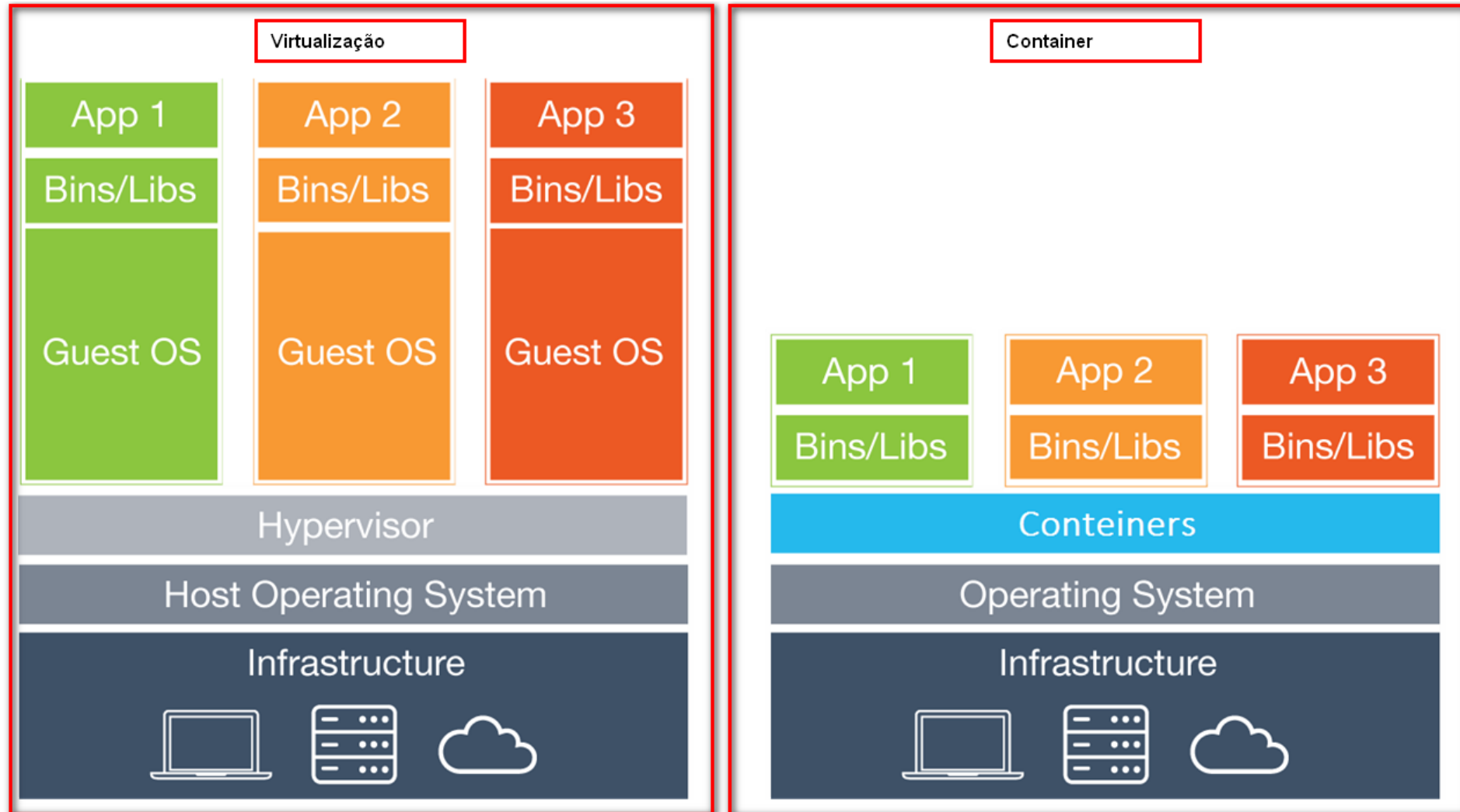
I O que é e o que não é Docker?

- **Docker não** é um sistema de virtualização tradicional.
- Em um ambiente de virtualização tradicional nós temos um S.O. completo e isolado
- **No Docker** nós temos recursos isolados que utilizam bibliotecas de kernel em comum (entre *host* e *container*), isso é possível pois o **Docker** utiliza como *backend* uma *lib* própria chamada **libcontainer**.

■ Docker - libcontainer

- O **Libcontainer** fornece uma implementação nativa em Go para criar contêineres com *namespaces*, *cgroups*, *capabilities*, e *filesystem access controls*.
- Ele permite que você gerencie o ciclo de vida do contêiner que executa operações adicionais depois que o contêiner é criado.

Virtualização X Container

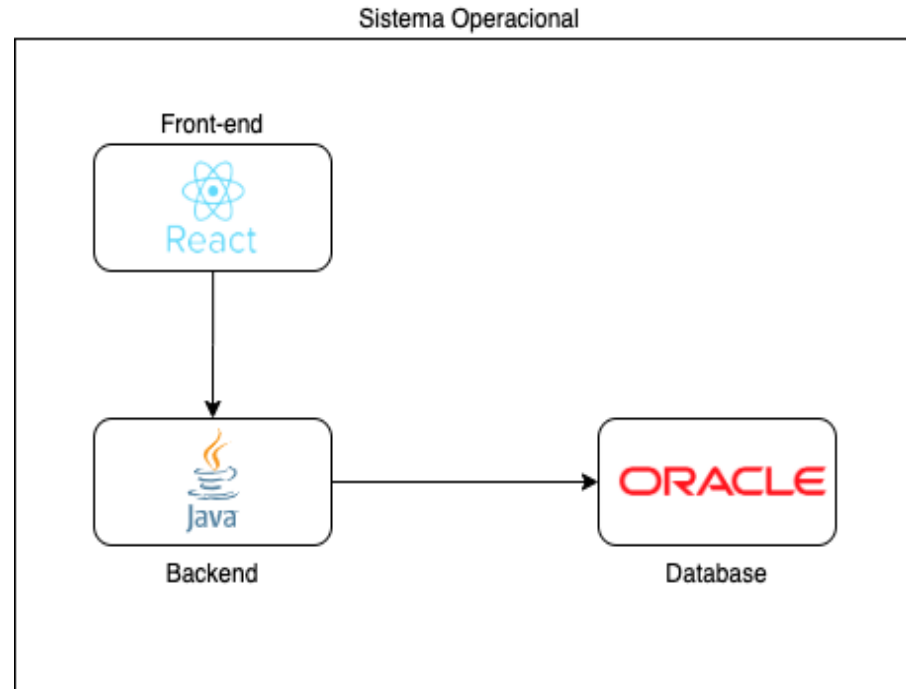


I Docker

- Quando vamos desenvolver nossos sistemas possuímos várias dependências para uma aplicação rodar como bibliotecas e também outras dependências, como banco de dados ou até mesmo outra aplicação, mas como fazer com que tudo funcione perfeitamente em qualquer máquina dos desenvolvedores do time e também nos servidores de homologação e produção?

Docker

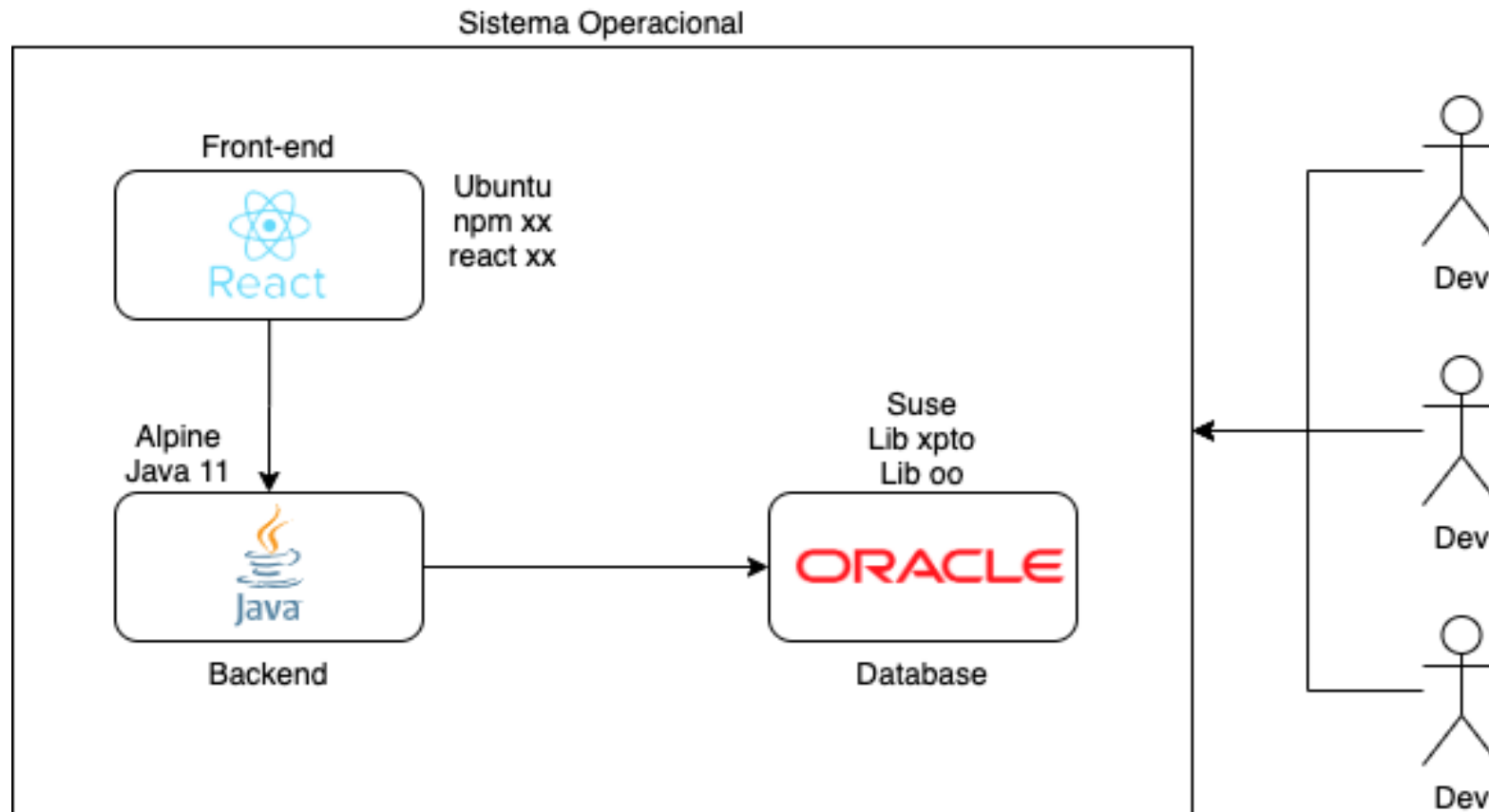
- Arquitetura de exemplo de uma aplicação rodando na máquina local.



- E como fazer tudo rodar sem problemas nas máquinas dos outros desenvolvedores do nosso time e também nos servidores?

Docker

- Arquitetura de exemplo de uma aplicação utilizada por vários devs.



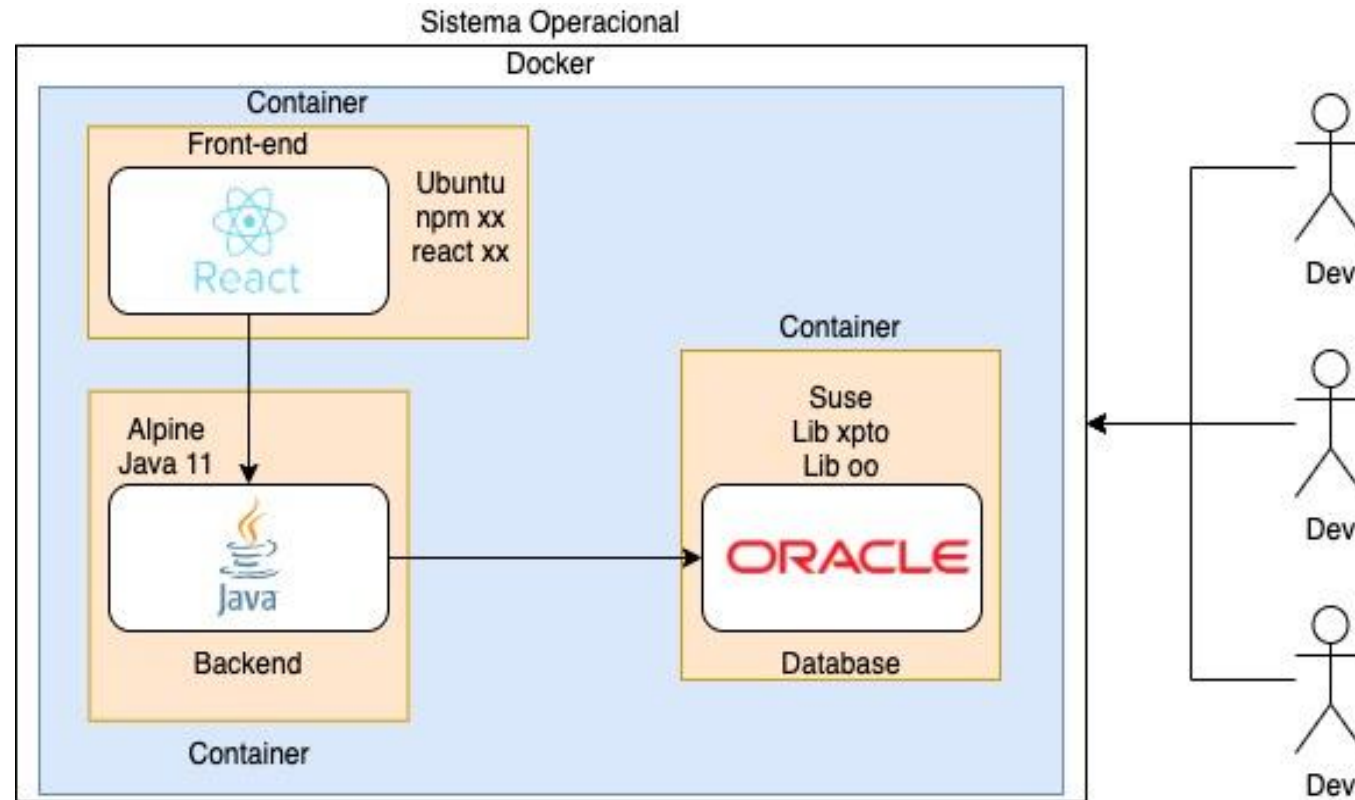
I Docker

- Para resolver esses problemas, o Docker veio para nos salvar!
- O Docker utiliza os **containers** para isolar os processos das nossas dependências a nível de disco, memória, processamento e rede, onde normalmente cada container deve ser responsável por apenas um processo que irá ser executado.



Docker

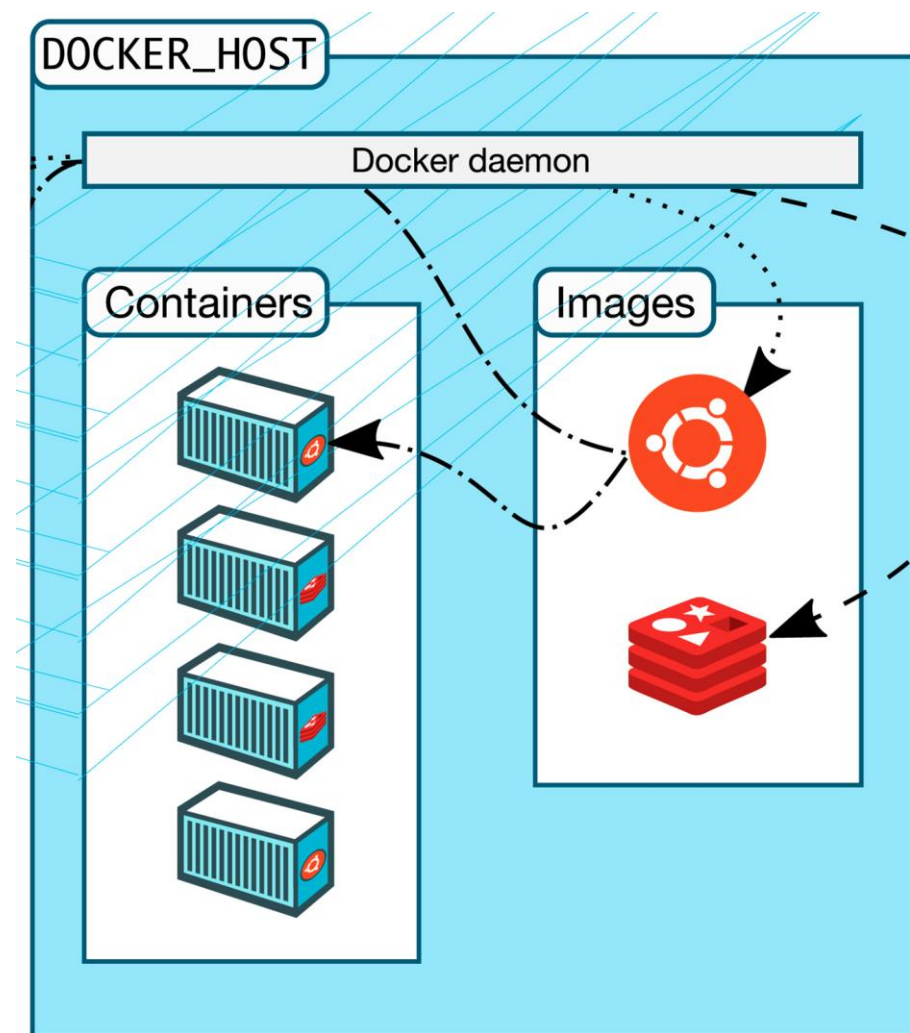
- Arquitetura de exemplo de uma aplicação utilizando Docker



- Ok, mas existem outras formas que podemos resolver esse problema desde softwares como uma boa organização, então por que utilizar containers?
- Flexível: Mesmo aplicações complexas podem rodar em containers.
- Leve: Utiliza e compartilha recursos do kernel do host, sendo bem mais eficiente do que outras abordagens.
- Portátil: É possível *buildar* na máquina local, rodar em outras máquinas de desenvolvedores, na cloud ou qualquer outro lugar.
- Baixo acoplamento: Por um container ser responsável por um processo, é possível substituir, atualizar ou parar um container sem interferir em outros.
- Escalável: Facilidade de aumentar e distribuir as réplicas de um container já rodando, escalando horizontalmente.
- Seguro: Os processos são restritos e isolados.

Docker

- Os containers são rodados a partir de imagens, um *template* com instruções e configurações para a criação do container.
- Além de configurações e instruções, a imagem pode ter arquivos necessários para a execução do container, como o arquivo JAR gerado pelo Spring Boot que deve ser executado para a aplicação subir.



Começando com Docker

Docker - Help

```
Prompt de Comando
C:\Users\cida>docker --help

Usage:  docker [OPTIONS] COMMAND

A self-sufficient runtime for containers

Common Commands:
  run      Create and run a new container from an image
  exec     Execute a command in a running container
```

```
Prompt de Comando  Windows PowerShell  cida@DESKTOP-HCKQX53: ~
O Windows PowerShell
Copyright (C) Microsoft Corporation. Todos os direitos reservados.

Instale o PowerShell mais recente para obter novos recursos e aprimorar a produtividade.

PS C:\Users\cida> docker --help

Usage:  docker [OPTIONS] COMMAND

A self-sufficient runtime for containers
```

```
$ docker --help
```

```
Prompt de Comando  Windows PowerShell  cida@DESKTOP-HCKQX53: ~
cida@DESKTOP-HCKQX53:~$ docker --help

Usage:  docker [OPTIONS] COMMAND

A self-sufficient runtime for containers

Common Commands:
  run      Create and run a new container from an image
```

```
Windows PowerShell x cida@DESKTOP-HCKQX53: ~ x + v
Run 'docker COMMAND --help' for more information on a command.

For more help on how to use Docker, head to https://docs.docker.com/go/guides/
cida@DESKTOP-HCKQX53:~$ docker run --help

Usage:  docker run [OPTIONS] IMAGE [COMMAND] [ARG...]

Create and run a new container from an image

Aliases:
  docker container run, docker run

Options:
  --add-host list          Add a custom host-to-IP mapping (host:ip)
  --annotation map        Add an annotation to the container (passed through to the OCI runtime) (default map[])
  -a, --attach list       Attach to STDIN, STDOUT or STDERR
  --blkio-weight uint16    Block IO (relative weight), between 10 and 1000, or 0 to disable (default 0)
  --blkio-weight-device list Block IO weight (relative device weight) (default [])
  --cap-add list          Add Linux capabilities
  --cap-drop list         Drop Linux capabilities
  --cgroup-parent string   Optional parent cgroup for the container
  --cgroupns string       Cgroup namespace to use (host|private)
  --detach                 Run the container in the Docker host's cgroup namespace
```

```
$ docker run --help
```



```
$ docker pull [image]
```

O comando `docker pull` baixa uma nova imagem ou atualizar uma já existente, sem executar um container.

```
$ docker run [image]
```

O comando `docker run` baixa a imagem e executa um container.

```
Windows PowerShell

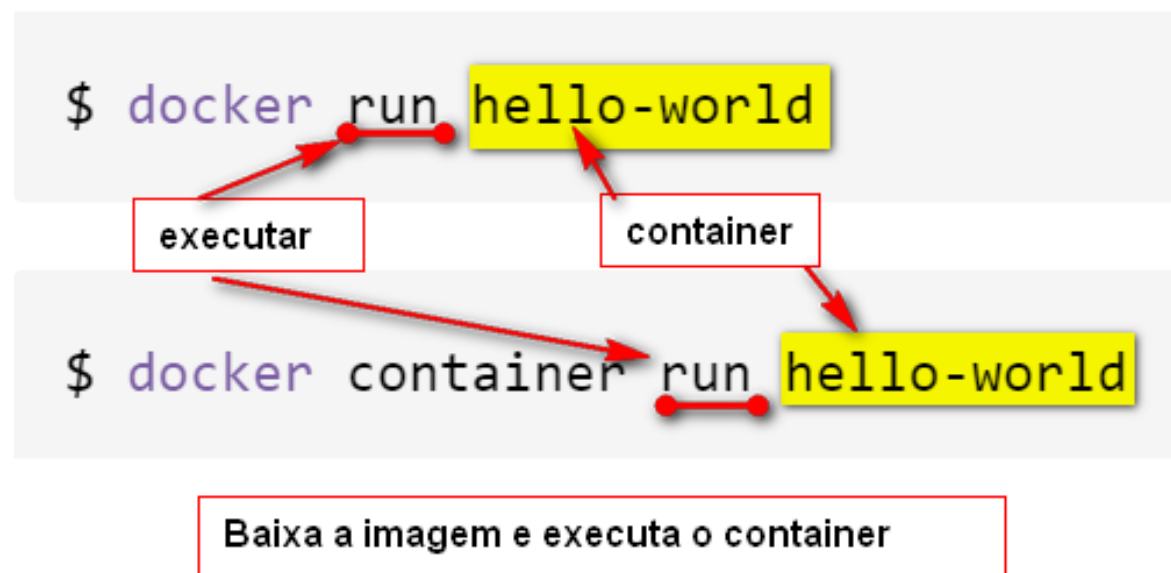
PS C:\Users\cida> docker pull ubuntu
Using default tag: latest
latest: Pulling from library/ubuntu
49b384cc7b4a: Pull complete
Digest: sha256:3f85b7caad41a95462cf5b787d8a04604c8262cdcdf9a472b8c52ef83375fe15
Status: Downloaded newer image for ubuntu:latest
docker.io/library/ubuntu:latest

What's Next?
View a summary of image vulnerabilities and recommendations → docker scout quickview ubuntu
PS C:\Users\cida> |
```

```
PS C:\Users\cida> docker run ubuntu
PS C:\Users\cida> |
```

Docker

- O Docker possui uma **imagem** personalizada de *hello-world* e serve para testar a instalação e validar se tudo funciona conforme o esperado.



```
Windows PowerShell
cida@DESKTOP-HCKQX53: ~
PS C:\Users\cida> docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Pull complete
Digest: sha256:a26bff933ddc26d5cdf7faa98b4ae1e3ec20c4985e6f87ac0973052224d24302
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

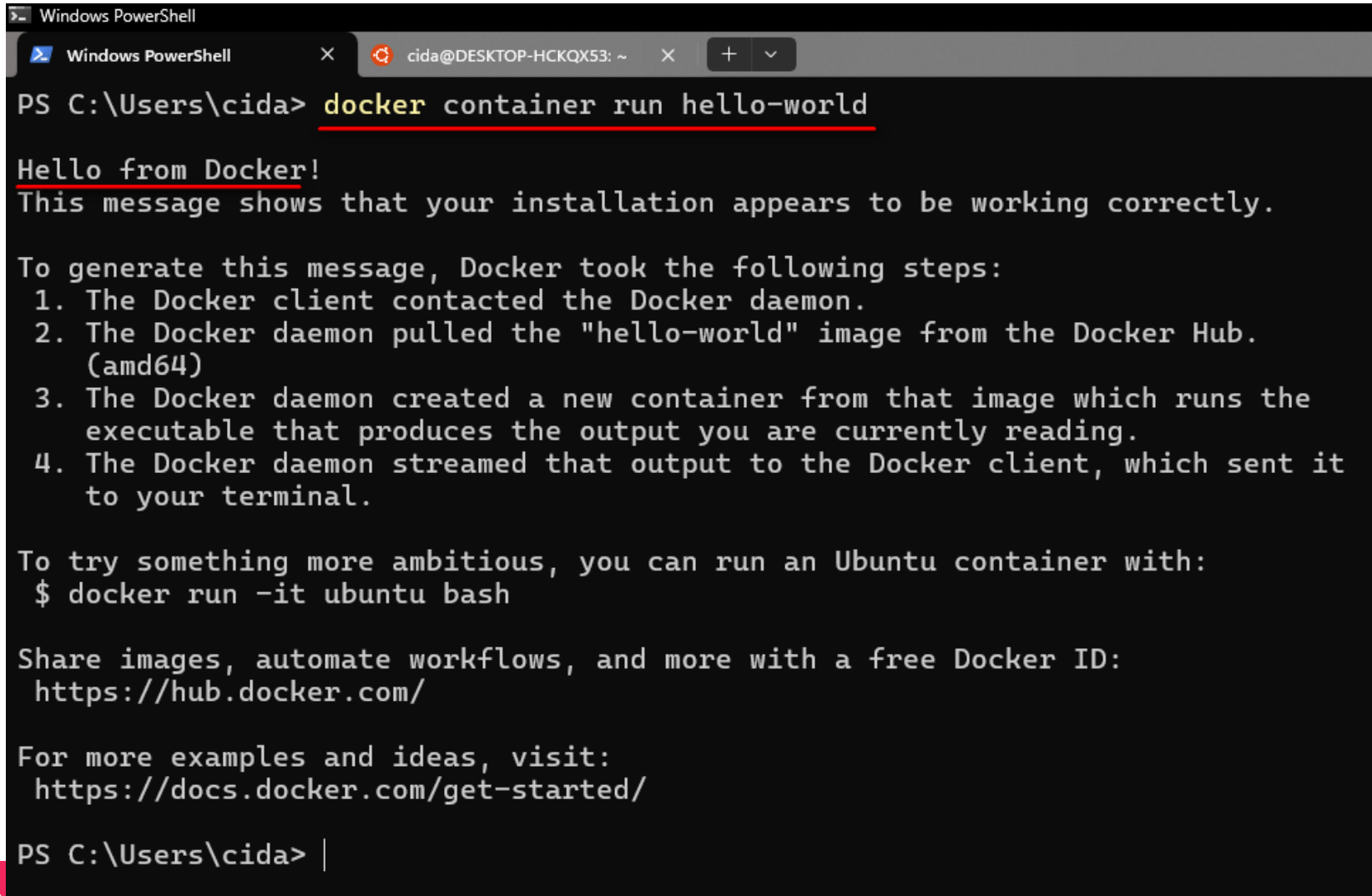
To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

PS C:\Users\cida> |
```



```
Windows PowerShell
PS C:\Users\cida> docker container run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
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For more examples and ideas, visit:
https://docs.docker.com/get-started/

PS C:\Users\cida> |
```

O comando `docker` se comunica com o **daemon** do Docker informando a ação desejada.

O **daemon** do Docker verifica se a **imagem** `hello-world` existe em seu host; caso ainda não, o Docker faz o download da imagem diretamente do Docker Hub.

O **daemon** do Docker cria um **novo container utilizando a imagem** que você acabou de baixar.

O **daemon** do Docker envia a saída para o comando `docker`, que imprime a mensagem no terminal.

O **Daemon** do Docker é um serviço que **cria e gerencia imagens** do Docker, usando os comandos do cliente. Essencialmente, o **daemon** do Docker serve como o centro de controle da sua implementação do Docker. O servidor no qual o **daemon** do Docker é executado é chamado de **host** do Docker.

Qual a diferença?

```
Windows PowerShell
PS C:\Users\cida> docker run hello-world
Unable to find image 'hello-world:latest' locally
latest: Pulling from library/hello-world
c1ec31eb5944: Pull complete
Digest: sha256:a26bfff933ddc26d5cdf7faa98b4ae1e3ec20c4985e6f87ac0973052224d24302
Status: Downloaded newer image for hello-world:latest

Hello from Docker!
This message shows that your installation appears to be working correctly.

To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

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https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

PS C:\Users\cida> |
```

```
Windows PowerShell
PS C:\Users\cida> docker container run hello-world

Hello from Docker!
This message shows that your installation appears to be working correctly.

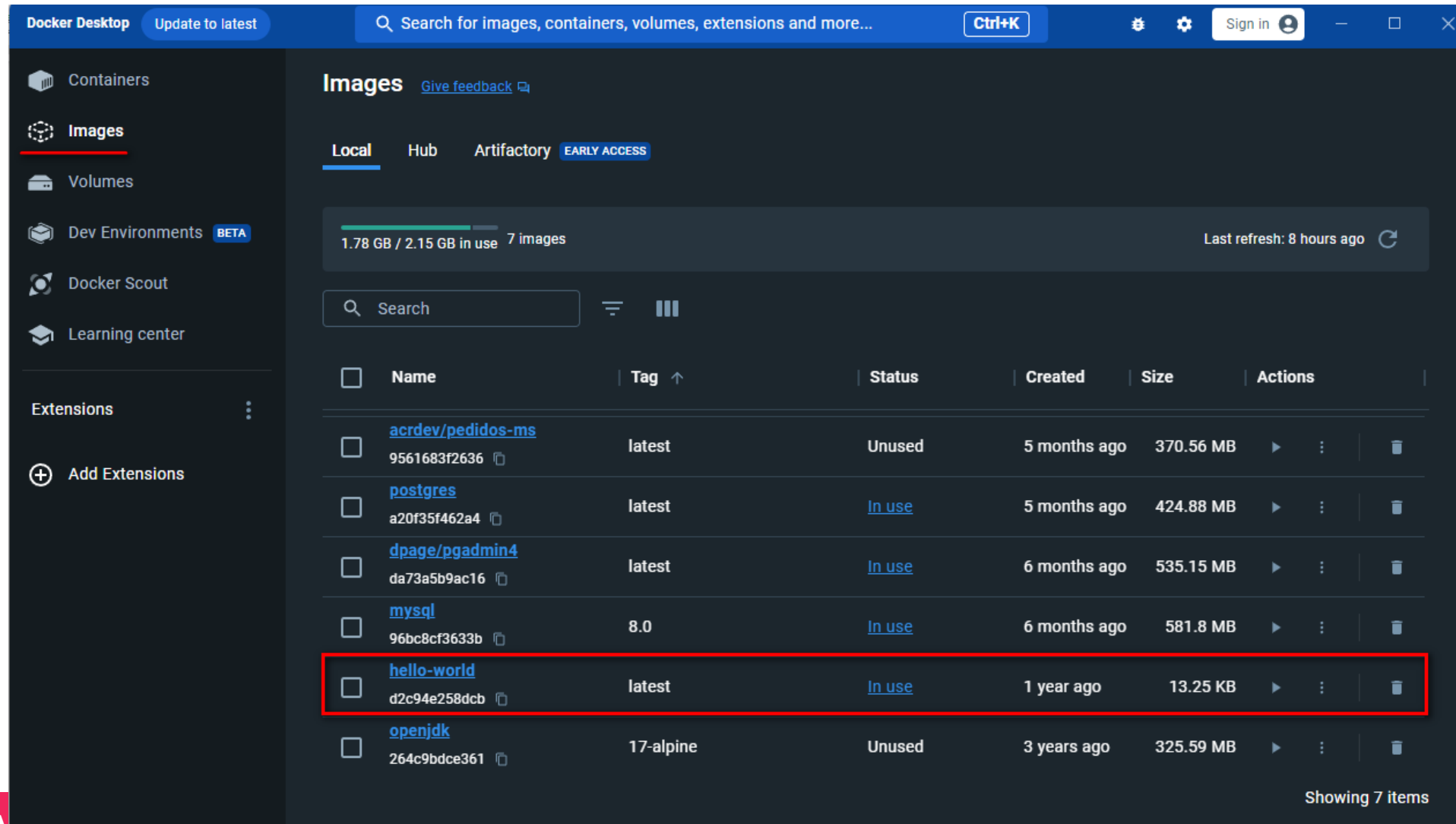
To generate this message, Docker took the following steps:
1. The Docker client contacted the Docker daemon.
2. The Docker daemon pulled the "hello-world" image from the Docker Hub.
   (amd64)
3. The Docker daemon created a new container from that image which runs the
   executable that produces the output you are currently reading.
4. The Docker daemon streamed that output to the Docker client, which sent it
   to your terminal.

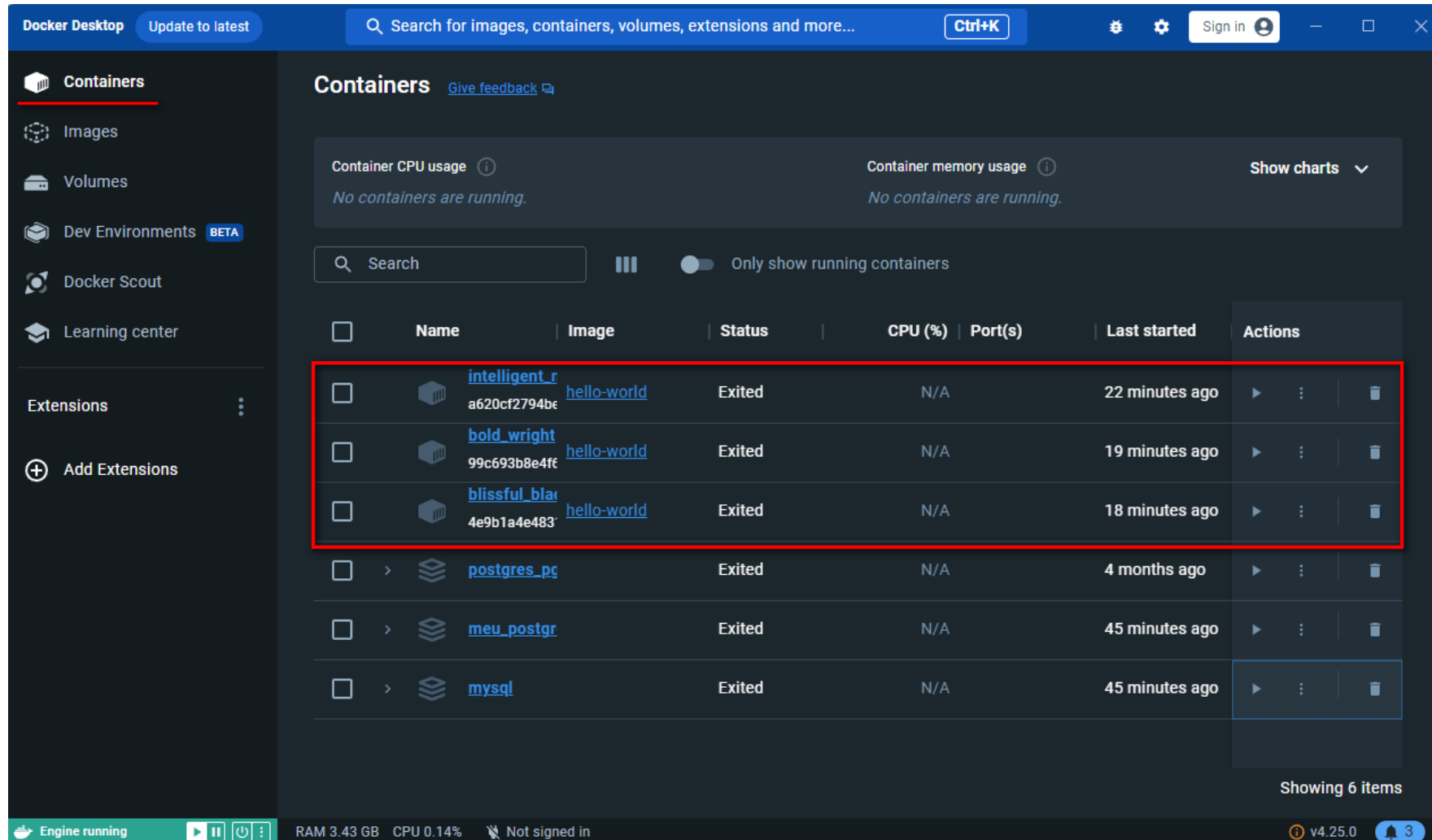
To try something more ambitious, you can run an Ubuntu container with:
$ docker run -it ubuntu bash

Share images, automate workflows, and more with a free Docker ID:
https://hub.docker.com/

For more examples and ideas, visit:
https://docs.docker.com/get-started/

PS C:\Users\cida> |
```





Docker - Listar Imagens

```
Windows PowerShell
PS C:\Users\cida> docker images
REPOSITORY          TAG                IMAGE ID           CREATED            SIZE
postgres            14-alpine         8258e2afe6e4      4 months ago      239MB
acrdev/pedidos-ms   latest            9561683f2636      5 months ago      371MB
postgres            latest            a20f35f462a4      5 months ago      425MB
dpage/pgadmin4      latest            da73a5b9ac16      5 months ago      535MB
mysql               8.0               96bc8cf3633b      6 months ago      582MB
hello-world         latest            d2c94e258dcb      12 months ago     13.3kB
openjdk             17-alpine         264c9bdce361      2 years ago       326MB
PS C:\Users\cida> |
```

```
$ docker images
```

```
# ou
```

```
$ docker image ls
```

Label	Descrição
REPOSITORY	O nome da imagem.
TAG	A versão da imagem.
IMAGE ID	Identificação da imagem.
CREATED	Quando a imagem foi criada.
SIZE	Tamanho da imagem.

Docker - Listar Containers

```
Windows PowerShell
PS C:\Users\cida> docker container ls
CONTAINER ID   IMAGE     COMMAND   CREATED   STATUS    PORTS   NAMES
PS C:\Users\cida>
```

```
$ docker container ls
#ou
$ docker ps
```

Com o `docker container ls` ou `docker ps`, podemos visualizar todos os containers em execução e ainda obter os detalhes sobre eles.

A saída do `docker container ls` é dividida em sete colunas.

Label	Descrição
CONTAINER ID	Identificação única do <i>container</i> .
IMAGE	A imagem que foi utilizada para a execução do <i>container</i> .
COMMAND	O comando em execução.
CREATED	Quando o <i>container</i> foi criado.
STATUS	O status atual do <i>container</i> .
PORTS	A porta do <i>container</i> e do <i>host</i> que esse <i>container</i> utiliza.
NAMES	O nome do <i>container</i> .

Docker - Listar Containers

```
Windows PowerShell
PS C:\Users\cida> docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
4e9b1a4e4831	hello-world	"/hello"	34 minutes ago	Exited (0) 28 minutes ago		blissful_blackburn
99c693b8e4f6	hello-world	"/hello"	35 minutes ago	Exited (0) 29 minutes ago		bold_wright
a620cf2794be	hello-world	"/hello"	38 minutes ago	Exited (0) 32 minutes ago		intelligent_margulis
e89ac921429d	dpage/pgadmin4	"/entrypoint.sh"	3 months ago	Exited (0) 3 months ago		dev-pgadmin
aef997f5231c	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
1e0a66606281	postgres	"docker-entrypoint.s..."	5 months ago	Exited (0) 13 minutes ago		postgres_container
d329263c1b43	dpage/pgadmin4	"/entrypoint.sh"	5 months ago	Exited (0) 13 minutes ago		pgadmin4_container
093bceaf70fa	mysql:8.0	"docker-entrypoint.s..."	5 months ago	Exited (0) 11 minutes ago		mysql_container

```
PS C:\Users\cida> |
```

```
$ docker container ls -a
# ou
$ docker ps -a
```

Com o `docker container ls -a` ou `docker ps -a`, podemos visualizar **todos os containers**, os que estão em execução e os que não estão sendo executados, e os detalhes.

Docker - Remover Containers

```
docker rm <id ou name>
```

Se o *container* estiver em execução podemos adicionar a *flag -f* (*force*) que para o *container* e em seguida o remove da memória local.

```
docker rm <id ou name> --force
```

```
PS C:\Users\cida> docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
4e9b1a4e4831	hello-world	"/hello"	22 hours ago	Exited (0) 22 hours ago		blissful_blackburn
99c693b8e4f6	hello-world	"/hello"	22 hours ago	Exited (0) 22 hours ago		bold_wright
a620cf2794be	hello-world	"/hello"	22 hours ago	Exited (0) 22 hours ago		intelligent_margulis
e89ac921429d	dpage/pgadmin4	"/entrypoint.sh"	3 months ago	Exited (0) 3 months ago		dev-pgadmin
ae9997f5231c	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
1e0a66606281	postgres	"docker-entrypoint.s..."	5 months ago	Exited (0) 6 minutes ago		postgres_container
d329263c1b43	dpage/pgadmin4	"/entrypoint.sh"	5 months ago	Exited (0) 6 minutes ago		pgadmin4_container
093bceaf70fa	mysql:8.0	"docker-entrypoint.s..."	5 months ago	Exited (0) 6 minutes ago		mysql_container

```
PS C:\Users\cida>
PS C:\Users\cida> docker rm 4e9b1a4e4831
4e9b1a4e4831
```

```
b2 C:/Users/cida> docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
0a333e3c1d49	mysql:8.0	"docker-entrypoint.s..."	2 months ago	Exited (0) 24 seconds ago		mysql_container
q35d5e3c1d49	postgres:14-alpine	"docker-entrypoint.s..."	2 months ago	Exited (0) 28 seconds ago		dev-postgresql
7e09e0e0e581	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
9e4d4d4e331c	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
68d9c051d5d9	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
9e30c45d4d4e	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
0a333e3c1d49	mysql:8.0	"docker-entrypoint.s..."	2 months ago	Exited (0) 24 seconds ago		mysql_container

```
b2 C:/Users/cida> docker rm 0a333e3c1d49
0a333e3c1d49
```

Docker - Remover Containers

```
PS C:\Users\cida> docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
99c693b8e4f6	hello-world	"/hello"	22 hours ago	Exited (0) 22 hours ago		<u>bold_wright</u>
a620cf2794be	hello-world	"/hello"	22 hours ago	Exited (0) 22 hours ago		intelligent_margulis
e89ac921429d	dpage/pgadmin4	"/entrypoint.sh"	3 months ago	Exited (0) 3 months ago		dev-pgadmin
aef997f5231c	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
1e0a66606281	postgres	"docker-entrypoint.s..."	5 months ago	Exited (0) 2 minutes ago		postgres_container
d329263c1b43	dpage/pgadmin4	"/entrypoint.sh"	5 months ago	Exited (0) 2 minutes ago		pgadmin4_container
093bceaf70fa	mysql:8.0	"docker-entrypoint.s..."	5 months ago	Exited (0) 2 minutes ago		mysql_container

```
PS C:\Users\cida> docker rm bold_wright
bold_wright
PS C:\Users\cida> docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
a620cf2794be	hello-world	"/hello"	22 hours ago	Exited (0) 22 hours ago		intelligent_margulis
e89ac921429d	dpage/pgadmin4	"/entrypoint.sh"	3 months ago	Exited (0) 3 months ago		dev-pgadmin
aef997f5231c	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
1e0a66606281	postgres	"docker-entrypoint.s..."	5 months ago	Exited (0) 3 minutes ago		postgres_container
d329263c1b43	dpage/pgadmin4	"/entrypoint.sh"	5 months ago	Exited (0) 3 minutes ago		pgadmin4_container
093bceaf70fa	mysql:8.0	"docker-entrypoint.s..."	5 months ago	Exited (0) 2 minutes ago		mysql_container

```
PS C:\Users\cida> |
```

Docker - Remover Containers

```
PS C:\Users\cida> docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
a620cf2794be	hello-world	"/hello"	22 hours ago	Exited (0) 22 hours ago		intelligent_margulis
e89ac921429d	dpage/pgadmin4	"/entrypoint.sh"	3 months ago	Exited (0) 3 months ago		dev-pgadmin
aef997f5231c	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
1e0a66606281	postgres	"docker-entrypoint.s..."	5 months ago	Exited (0) 4 minutes ago		postgres_container
d329263c1b43	dpage/pgadmin4	"/entrypoint.sh"	5 months ago	Exited (0) 4 minutes ago		pgadmin4_container
093bceaf70fa	mysql:8.0	"docker-entrypoint.s..."	5 months ago	Exited (0) 3 minutes ago		mysql_container

```
PS C:\Users\cida> docker rm a62
a62
```

```
PS C:\Users\cida> docker container ls -a
```

CONTAINER ID	IMAGE	COMMAND	CREATED	STATUS	PORTS	NAMES
e89ac921429d	dpage/pgadmin4	"/entrypoint.sh"	3 months ago	Exited (0) 3 months ago		dev-pgadmin
aef997f5231c	postgres:14-alpine	"docker-entrypoint.s..."	3 months ago	Exited (0) 3 months ago		dev-postgresql
1e0a66606281	postgres	"docker-entrypoint.s..."	5 months ago	Exited (0) 4 minutes ago		postgres_container
d329263c1b43	dpage/pgadmin4	"/entrypoint.sh"	5 months ago	Exited (0) 4 minutes ago		pgadmin4_container
093bceaf70fa	mysql:8.0	"docker-entrypoint.s..."	5 months ago	Exited (0) 4 minutes ago		mysql_container

```
PS C:\Users\cida> |
```


Docker - Remover Image

```
$ docker image rm <Nome ou ID da imagem>
```

```
# ou
```

```
$ docker rmi <id>
```

```
PS C:\Users\cida> docker images
REPOSITORY      TAG          IMAGE ID      CREATED        SIZE
postgres        14-alpine   8258e2afe6e4  4 months ago  239MB
acrdev/pedidos-ms latest      9561683f2636  5 months ago  371MB
postgres        latest      a20f35f462a4  5 months ago  425MB
dpape/pgadmin4   latest      da73a5b9ac16  5 months ago  535MB
mysql           8.0         96bc8cf3633b  6 months ago  582MB
hello-world      latest      d2c94e258dcb  12 months ago 13.3kB
openjdk          17-alpine   264c9bdce361  2 years ago   326MB
PS C:\Users\cida> docker rmi d2c
Untagged: hello-world:latest
Untagged: hello-world@sha256:a26bff933ddc26d5cdf7faa98b4ae1e3ec20c4985e6f87ac0973052224d24302
Deleted: sha256:d2c94e258dcb3c5ac2798d32e1249e42ef01cba4841c2234249495f87264ac5a
Deleted: sha256:ac28800ec8bb38d5c35b49d45a6ac4777544941199075dff8c4eb63e093aa81e
PS C:\Users\cida> docker images
REPOSITORY      TAG          IMAGE ID      CREATED        SIZE
postgres        14-alpine   8258e2afe6e4  4 months ago  239MB
acrdev/pedidos-ms latest      9561683f2636  5 months ago  371MB
postgres        latest      a20f35f462a4  5 months ago  425MB
dpape/pgadmin4   latest      da73a5b9ac16  5 months ago  535MB
mysql           8.0         96bc8cf3633b  6 months ago  582MB
openjdk          17-alpine   264c9bdce361  2 years ago   326MB
PS C:\Users\cida> |
```




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