

System Programming & OS 실습

Appendix2. Docker

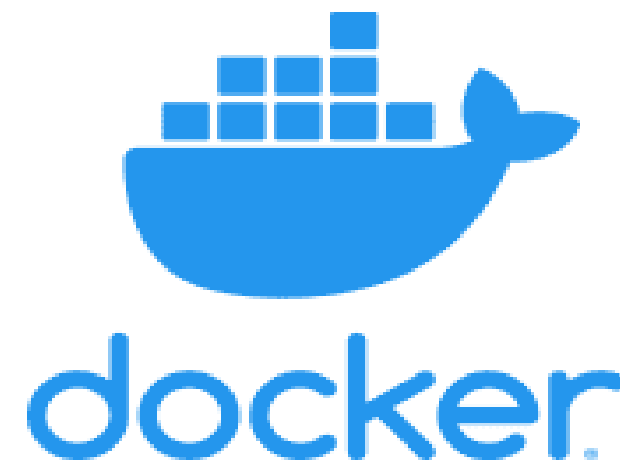
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- What is Docker?
- Virtual Machine and Docker
- Docker Registries

• Docker

- 가상화 소프트웨어
- 간단한 application의 개발 및 배포
- Application에 필요한 모든 dependencies, configuration, system tools, runtime을 함께 패키징



What is docker?

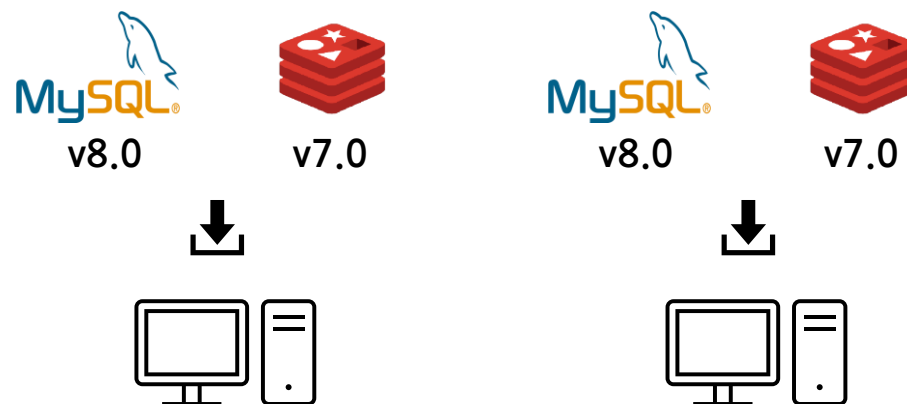
- 왜 이것이 중요한지?
- Docker 이전에는 어떻게 작업이 이루어졌는지?

• Docker 이전의 작업

- 개발자는 자신의 로컬 기기의 OS에 모든 서비스를 직접 설치하고 구성

각 OS 환경마다 설치 과정이 다름

오류가 발생할 수 있는 많은 단계들이 존재

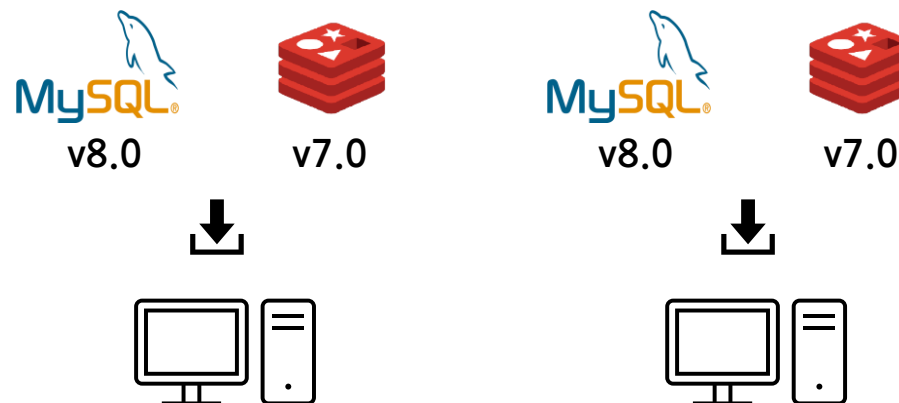
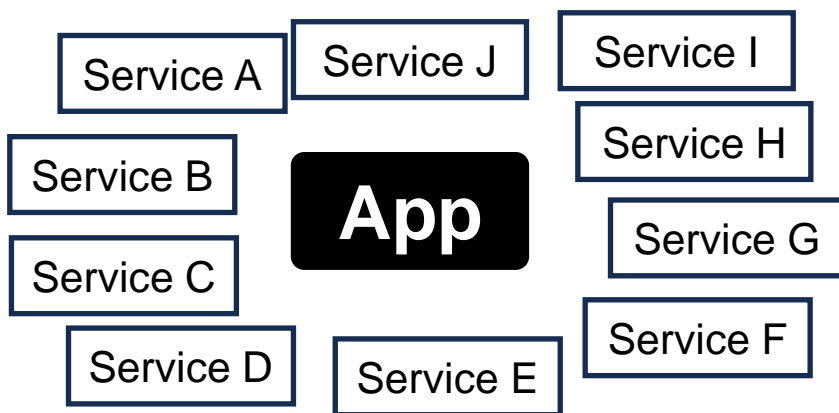


What is docker?

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• Docker 이전의 작업

- 10개의 서비스를 사용한다면, 각 개발자는 이 10개의 서비스를 모두 설치해야 함

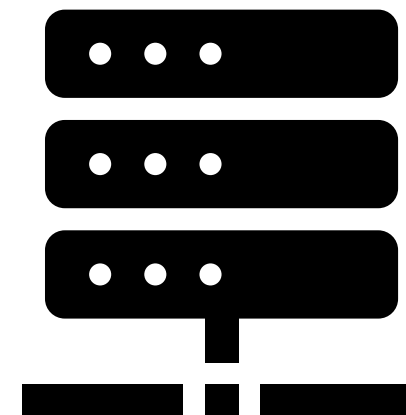
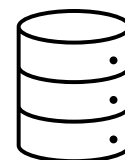
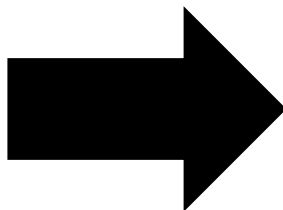
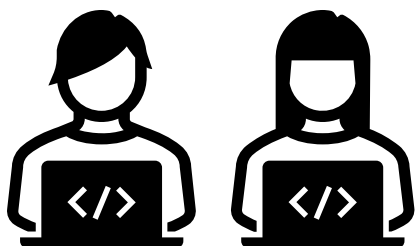


What is docker?

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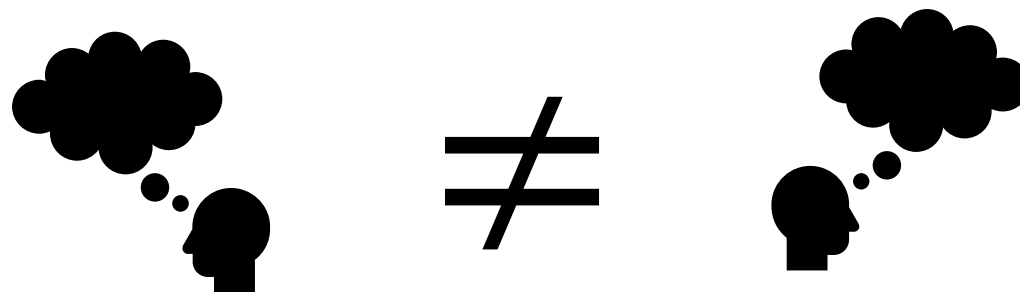
• Docker 이전의 작업

- 설치와 설정은 서버의 OS에 직접 수행
- 종속성으로 인해 버전 간의 충돌이 발생할 수 있음



• Docker 이전의 작업

- 수작업으로 인한 문제발생 가능성
- 필요한 작업 증가
- ...



• Docker를 사용한 작업

- 독립적인 환경
- Docker를 통해 패키징된 Postgres

1개의 Docker command를 사용하여 서비스를
Docker container로 시작 가능

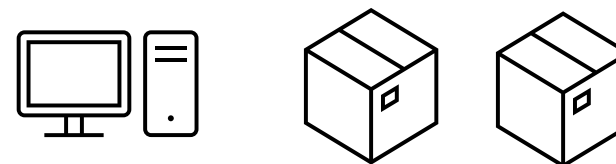
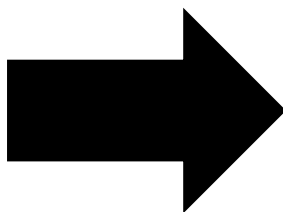
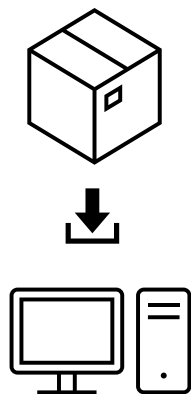
모든 OS에서 command 동일

모든 서비스에 대한 command 동일



• Docker를 사용한 작업

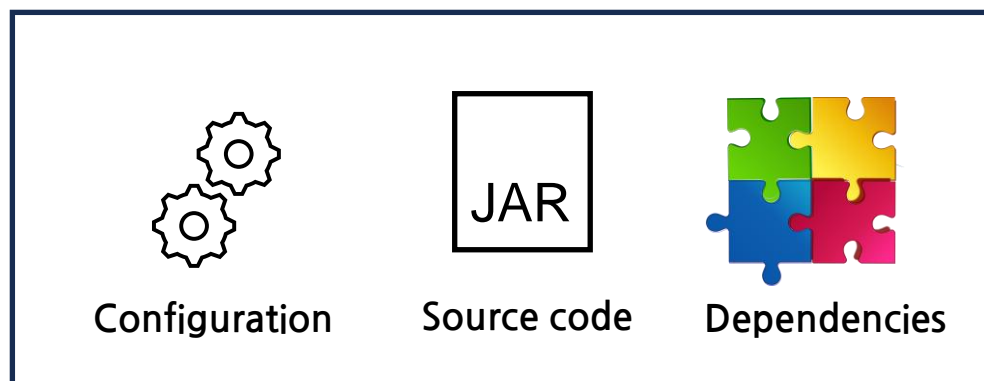
- 모든 OS에서 command 동일



docker run mysql
docker run redis
docker run ...

• Docker를 사용한 작업

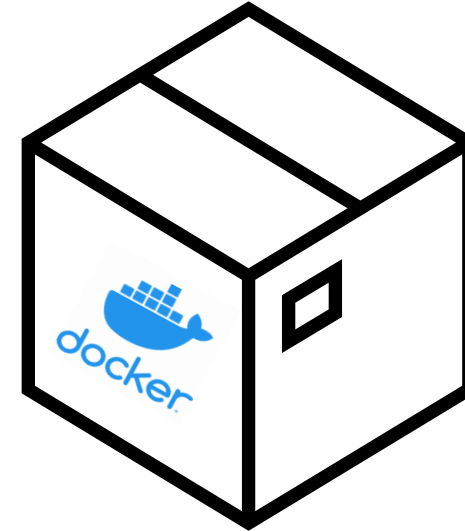
- Docker artifact는 application이 필요로 하는 모든 것을 포함
- 서버에서 별도의 설정이 필요하지 않음



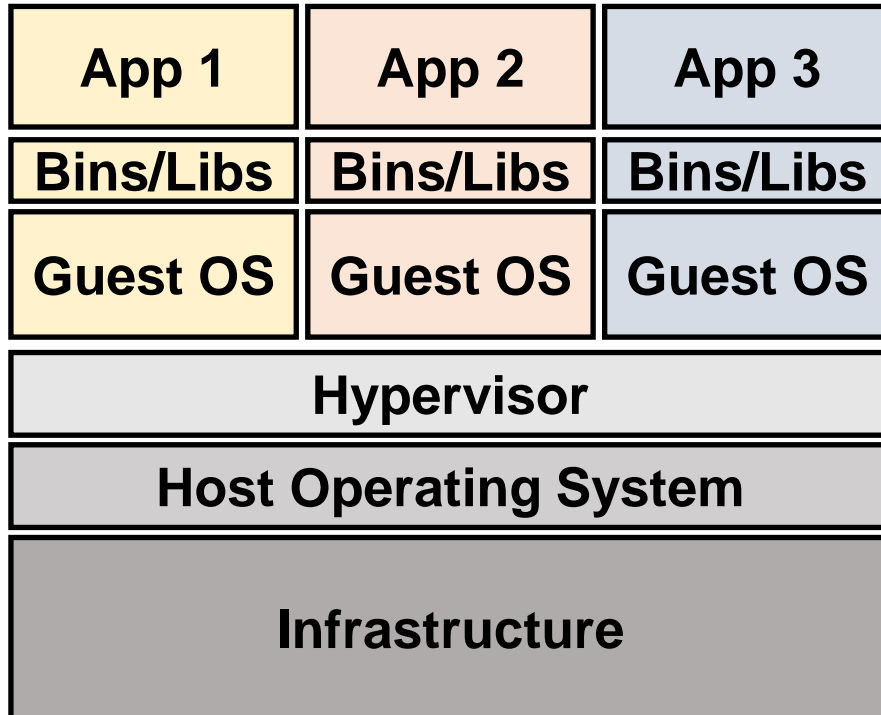
What is docker?

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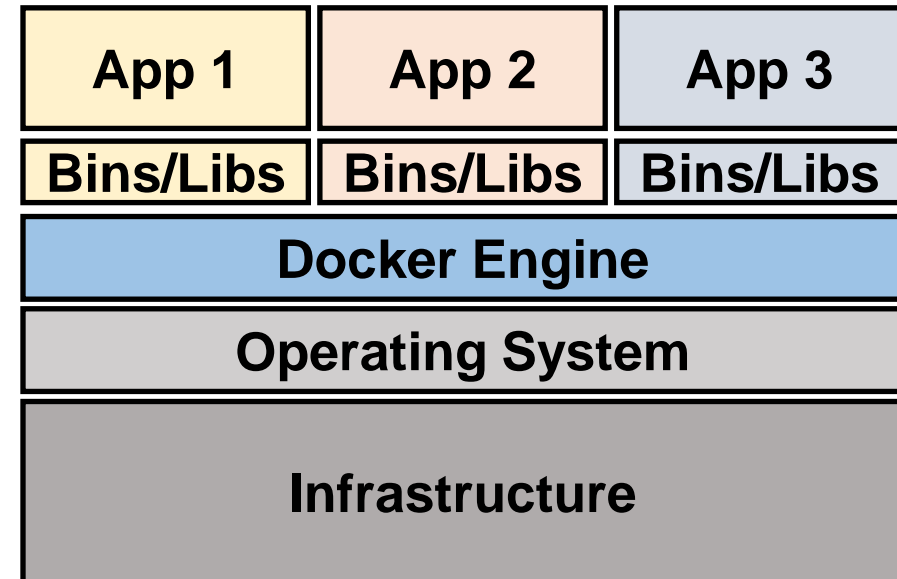
- Images와 containers?



- Virtual Machine과 Docker



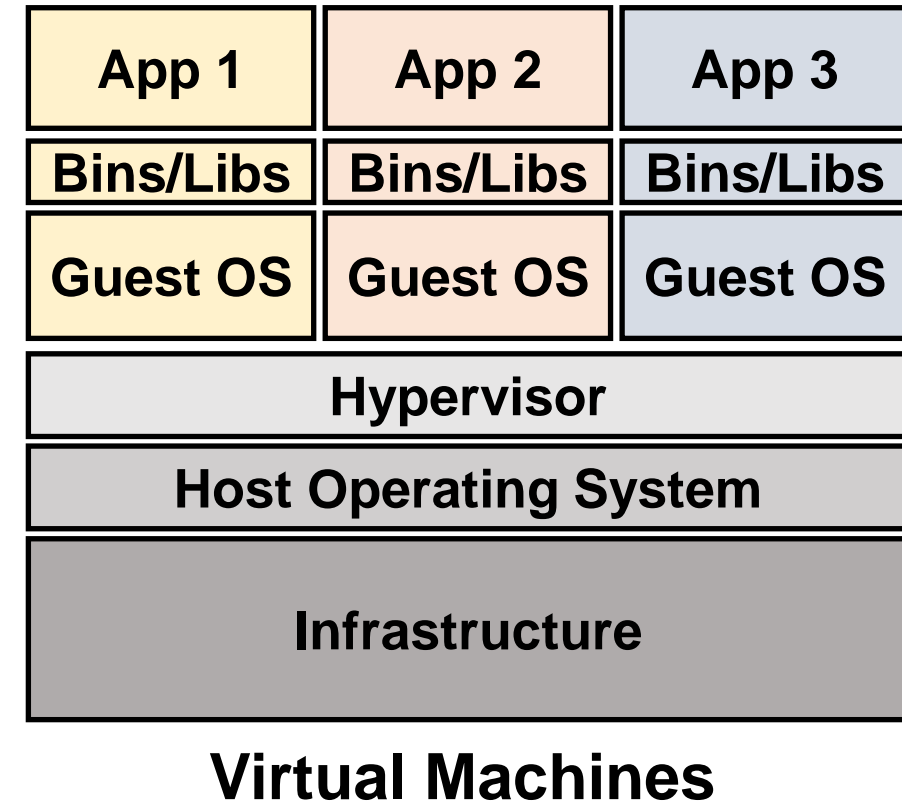
Virtual Machines



Docker

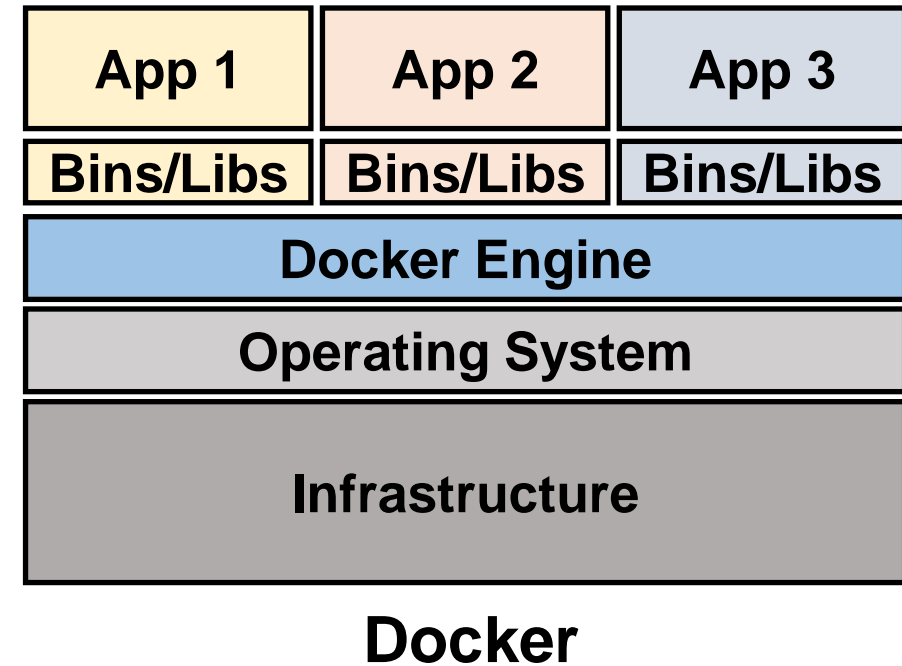
• Virtual Machine

- Hypervisor를 통해 여러 개의 운영체제 생성 및 관리
- 성능 손실
- 배포 시 용량 - 게스트 운영체제를 사용하기 위한 라이브러리, 커널 등

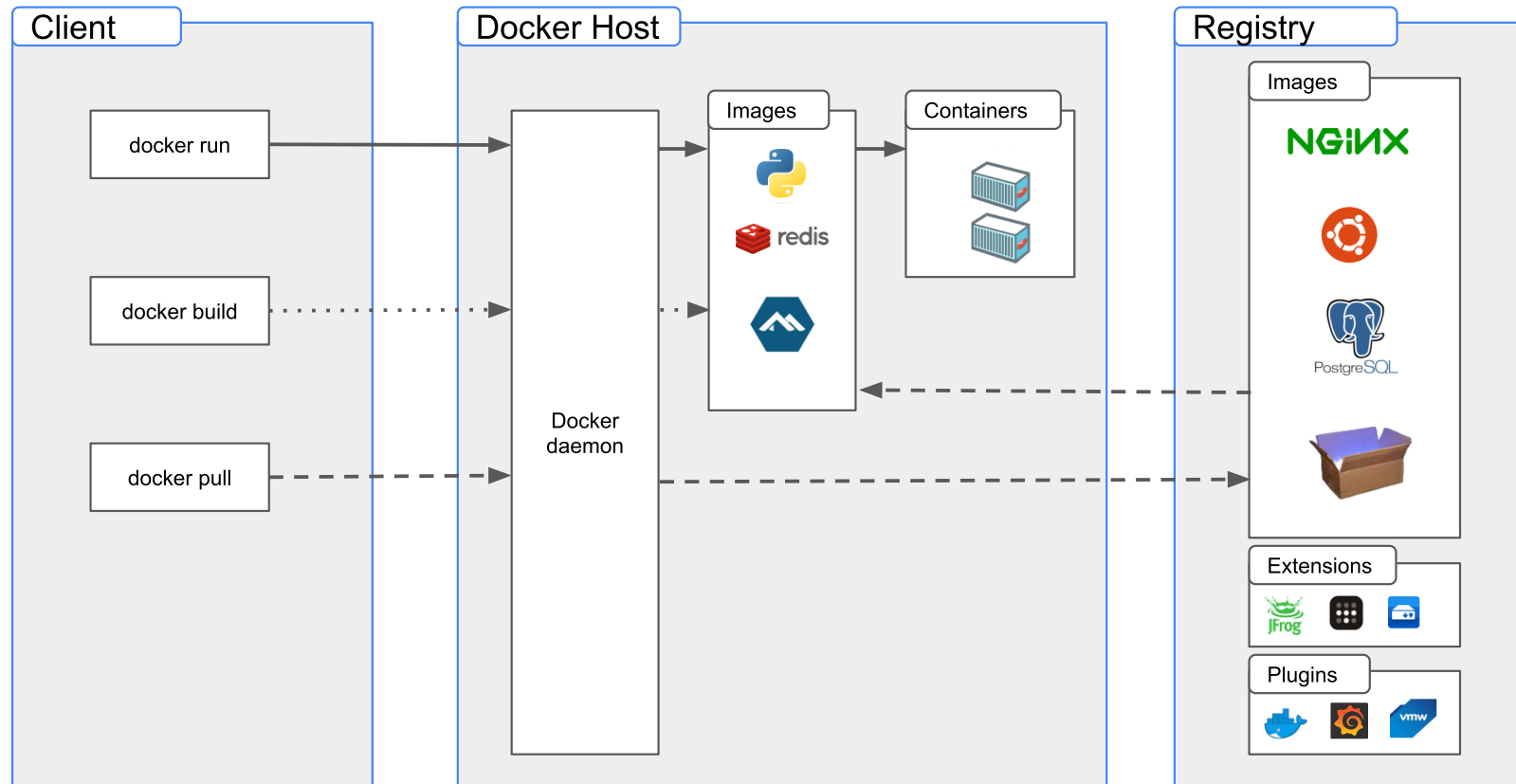


• Docker

- 낮은 성능 손실
- 배포 시 용량 - 커널 공유해서 사용, 적은 용량



• Docker



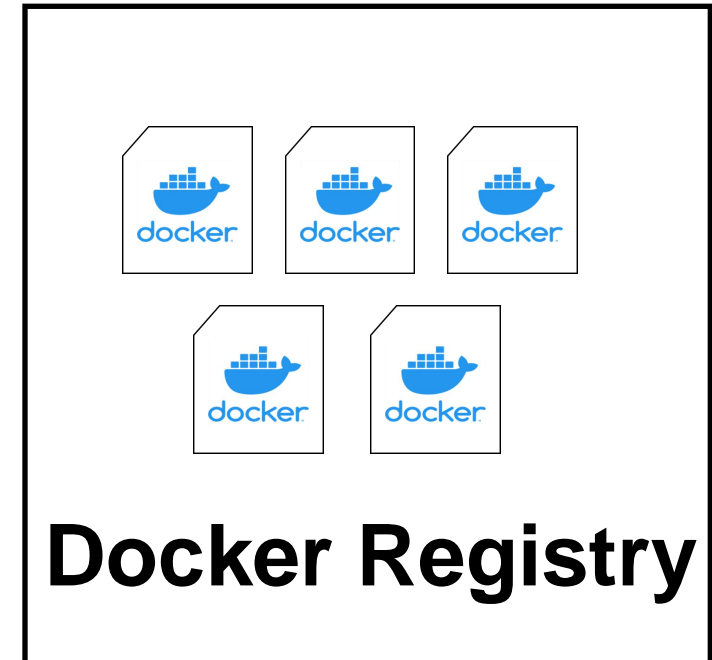
• Registries

- 이미지를 어떻게 가져와야 하는지?



• Docker Registries

- Docker 이미지를 위한 저장 및 배포 시스템
- Redis, Mongo, Postgres와 같은 애플리케이션에서
사용 가능한 공식 이미지
- 지속적으로 관리되는 이미지

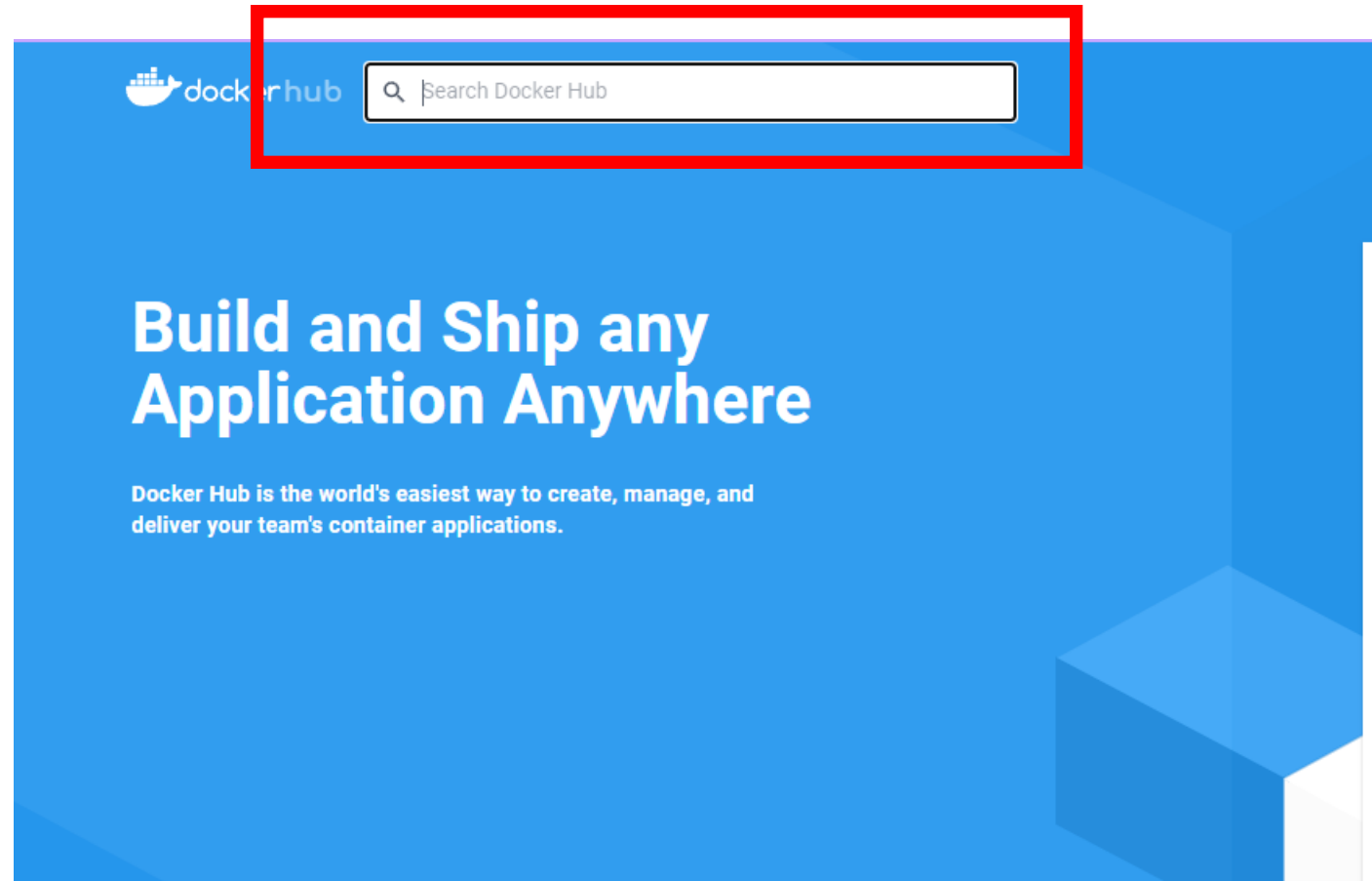


- Docker Registries

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



- Docker hub



• Docker hub

The screenshot shows the Docker Hub search results for the query 'redis'. On the left, a sidebar contains filter categories: 'Filters', 'Products' (with checkboxes for Images, Extensions, and Plugins), 'Trusted Content' (with checkboxes for Docker Official Image, Verified Publisher, and Sponsored OSS), and 'Operating Systems' (with checkboxes for Linux and Windows). The main content area displays search results. The first result, 'redis', is highlighted with a red box and includes a 'DOCKER OFFICIAL IMAGE' badge. It shows 1B+ downloads, 10K+ stars, and 13,478,095 pulls last week. The second result, 'redislabs/redisearch', is also visible. A 'Best Match' dropdown is located in the top right corner of the results area.

Filters

Products

- ☐ Images
- ☐ Extensions
- ☐ Plugins

Trusted Content

- ☐ Docker Official Image
- ☐ Verified Publisher
- ☐ Sponsored OSS

Operating Systems

- ☐ Linux
- ☐ Windows

1 - 25 of 10,000 results for redis.

Best Match

redis DOCKER OFFICIAL IMAGE 1B+ · ☆ 10K+
Updated 8 days ago

Redis is an open source key-value store that functions as a data structure server.

Linux Windows ARM ARM 64 386 mips64le PowerPC 64 LE x86-64 IBM Z

Pulls: 13,478,095
Last week

[Learn more](#)

redislabs/redisearch VERIFIED PUBLISHER 10M+ · ☆ 57
By Redis · Updated 7 days ago

Redis With the RedisSearch module pre-loaded. See <http://redisearch.io>

Linux x86-64

• Docker Official image

- 품질 보증 - 내용과 구성에 일관된 기준을 준수
- 업데이트 - 정기적으로 업데이트 및 보안 패치, 소프트웨어 버전 업그레이드, 최적화를 진행
- 보안 - 안전한 방식으로 생성되며, 알려진 보안 취약성이 발견될 경우 즉시 패치를 진행
- 명료성 - 이미지를 어떻게 사용할 수 있는지에 대한 가이드를 제공

• Docker Official image

The screenshot shows the Docker Hub page for the `redis` image. At the top, there's a header with the Redis logo, the name `redis`, a badge for "DOCKER OFFICIAL IMAGE", and statistics: "1B+" downloads and "10K+" stars. Below this is a description: "Redis is an open source key-value store that functions as a data structure server." To the right of the header is a red-bordered box containing a button labeled "docker pull redis" with a download icon.

Below the header, there are two tabs: "Overview" (selected) and "Tags". The main content area is divided into two columns. The left column, which is highlighted with a red border, contains a "Quick reference" section and a "Supported tags and respective Dockerfile links" section. The right column contains "Recent Tags", "About Official Images", and "Why Official Images?".

Quick reference

- Maintained by: [the Docker Community](#)
- Where to get help: [the Docker Community Slack](#), [Server Fault](#), [Unix & Linux](#), or [Stack Overflow](#)

Supported tags and respective Dockerfile links

- `7.2.0`, `7.2`, `7`, `latest`, `7.2.0-bookworm`, `7.2-bookworm`, `7-bookworm`, `bookworm`
- `7.2.0-alpine`, `7.2-alpine`, `7-alpine`, `alpine`, `7.2.0-alpine3.18`, `7.2-alpine3.18`, `7-alpine3.18`, `alpine3.18`
- `7.0.12`, `7.0`, `7.0.12-bookworm`, `7.0-bookworm`
- `7.0.12-alpine`, `7.0-alpine`, `7.0.12-alpine3.18`, `7.0-alpine3.18`
- `6.2.13`, `6.2`, `6`, `6.2.13-bookworm`, `6.2-bookworm`, `6-bookworm`
- `6.2.13-alpine`, `6.2-alpine`, `6-alpine`, `6.2.13-alpine3.18`, `6.2-alpine3.18`, `6-alpine3.18`
- `6.0.20`, `6.0`, `6.0.20-bookworm`, `6.0-bookworm`
- `6.0.20-alpine`, `6.0-alpine`, `6.0.20-alpine3.18`, `6.0-alpine3.18`

Recent Tags

`latest` `bookworm` `alpine3.18` `alpine` `7.2.0-bookworm`
`7.2.0-alpine3.18` `7.2.0-alpine` `7.2.0` `7.2-bookworm`
`7.2-alpine3.18`

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.

Quick reference (cont.)

• Docker Official image

**redis**

DOCKER OFFICIAL IMAGE • 1B+ • 10K+

Redis is an open source key-value store that functions as a data structure server.

docker pull redis



How to use this image

[Overview](#) [Tags](#)

Quick reference

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[the Docker Community](#)
- Where to get help:
[the Docker Community Slack](#), [Server Fault](#), [Unix & Linux](#), or [Stack Overflow](#)

Supported tags and respective Dockerfile links

- [7.2.0](#), [7.2](#), [7](#), [latest](#), [7.2.0-bookworm](#), [7.2-bookworm](#), [7-bookworm](#), [bookworm](#)
- [7.2.0-alpine](#), [7.2-alpine](#), [7-alpine](#), [alpine](#), [7.2.0-alpine3.18](#), [7.2-alpine3.18](#), [7-alpine3.18](#), [alpine3.18](#)
- [7.0.12](#), [7.0](#), [7.0.12-bookworm](#), [7.0-bookworm](#)
- [7.0.12-alpine](#), [7.0-alpine](#), [7.0.12-alpine3.18](#), [7.0-alpine3.18](#)
- [6.2.13](#), [6.2](#), [6](#), [6.2.13-bookworm](#), [6.2-bookworm](#), [6-bookworm](#)
- [6.2.13-alpine](#), [6.2-alpine](#), [6-alpine](#), [6.2.13-alpine3.18](#), [6.2-alpine3.18](#), [6-alpine3.18](#)
- [6.0.20](#), [6.0](#), [6.0.20-bookworm](#), [6.0-bookworm](#)
- [6.0.20-alpine](#), [6.0-alpine](#), [6.0.20-alpine3.18](#), [6.0-alpine3.18](#)

Recent Tags

[latest](#) [bookworm](#) [alpine3.18](#) [alpine](#) [7.2.0-bookworm](#)
[7.2.0-alpine3.18](#) [7.2.0-alpine](#) [7.2.0](#) [7.2-bookworm](#)
[7.2-alpine3.18](#)

About Official Images

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start a redis instance

```
$ docker run --name some-redis -d redis
```

start with persistent storage

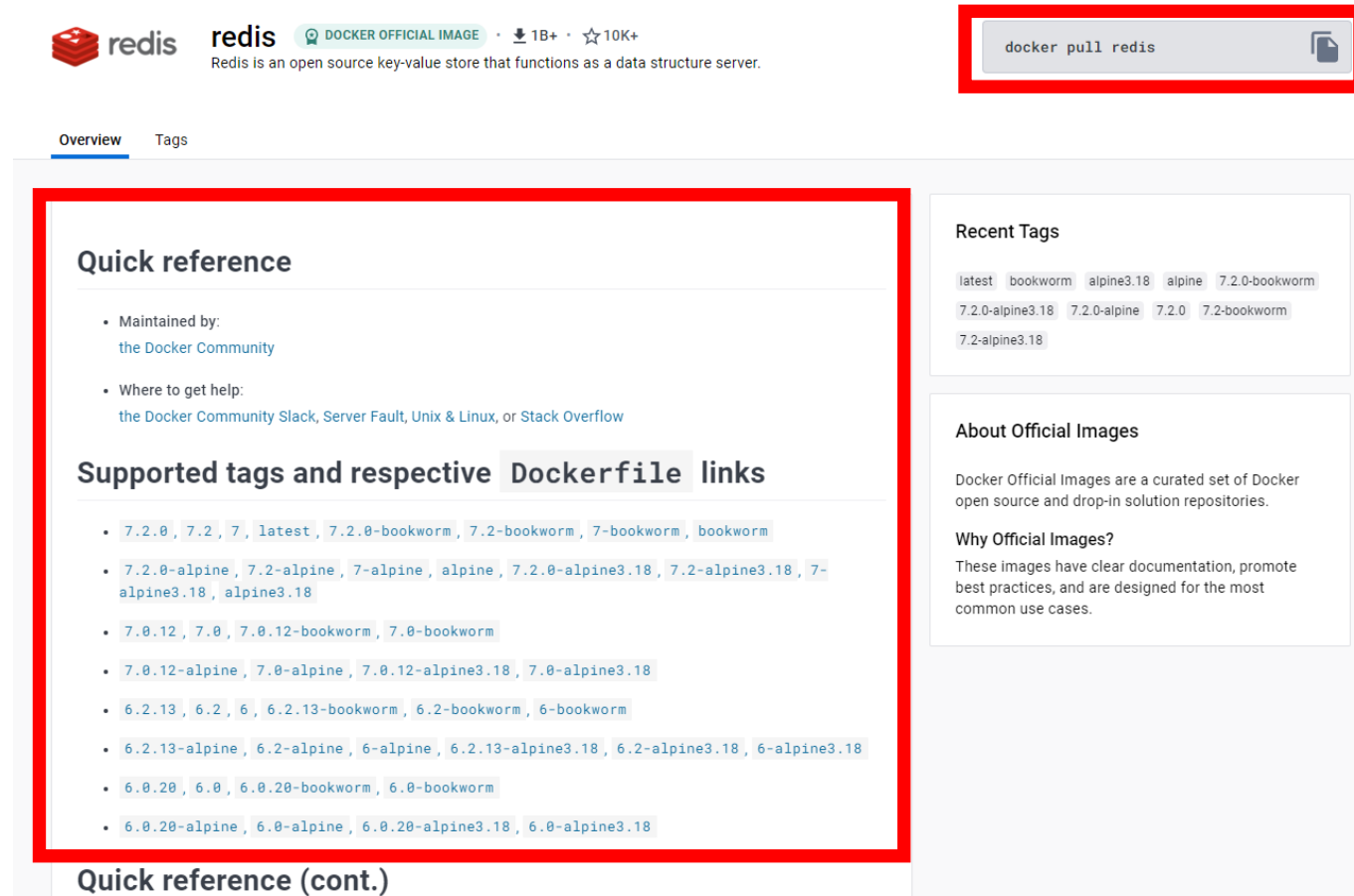
```
$ docker run --name some-redis -d redis redis-server --save 60 1 --loglevel warning
```

There are several different persistence strategies to choose from. This one will save a snapshot of the DB every 60 seconds if at least 1 write operation was performed (it will also lead to more logs, so the `loglevel` option may be desirable). If persistence is enabled, data is stored in the `VOLUME /data`, which can be used with `--volumes-from some-volume-container` or `-v /docker/host/dir:/data` (see [docs.docker volumes](#)).

For more about Redis Persistence, see <http://redis.io/topics/persistence>.

Quick reference (cont.)

• Docker Official image



redis DOCKER OFFICIAL IMAGE · 1B+ · 10K+

Redis is an open source key-value store that functions as a data structure server.

`docker pull redis`

Quick reference

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

Supported tags and respective Dockerfile links

- 7.2.0, 7.2, 7, latest, 7.2.0-bookworm, 7.2-bookworm, 7-bookworm, bookworm
- 7.2.0-alpine, 7.2-alpine, 7-alpine, alpine, 7.2.0-alpine3.18, 7.2-alpine3.18, 7-alpine3.18, alpine3.18
- 7.0.12, 7.0, 7.0.12-bookworm, 7.0-bookworm
- 7.0.12-alpine, 7.0-alpine, 7.0.12-alpine3.18, 7.0-alpine3.18
- 6.2.13, 6.2, 6, 6.2.13-bookworm, 6.2-bookworm, 6-bookworm
- 6.2.13-alpine, 6.2-alpine, 6-alpine, 6.2.13-alpine3.18, 6.2-alpine3.18, 6-alpine3.18
- 6.0.20, 6.0, 6.0.20-bookworm, 6.0-bookworm
- 6.0.20-alpine, 6.0-alpine, 6.0.20-alpine3.18, 6.0-alpine3.18

Recent Tags

latest bookworm alpine3.18 alpine 7.2.0-bookworm
7.2.0-alpine3.18 7.2.0-alpine 7.2.0 7.2-bookworm
7.2-alpine3.18

About Official Images

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Quick reference (cont.)

• Registry vs Repository

- Registry - Docker 이미지들을 저장하고 배포하기 위한 서버 측 응용 프로그램 또는 서비스
- Repository - Docker Registry 내에서 특정 이미지와 관련된 모든 버전의 이미지들의 집합

TAG

[latest](#)

Last pushed 8 days ago by [dojianky](#)

DIGEST

af803d7c006e

57b3ebf7bac6

e5fed1a8f461

+5 more...

OS/ARCH

linux/386

linux/amd64

linux/arm/v5

VULNERABILITIES

2 C

27 H

12 M

22 L

2 C

27 H

12 M

22 L

2 C

27 H

12 M

22 L


COMPRESSED SIZE

49.07 MB

49.01 MB

45.37 MB

docker pull redis:latest



TAG

[bookworm](#)

Last pushed 8 days ago by [dojianky](#)

DIGEST

af803d7c006e

57b3ebf7bac6

e5fed1a8f461

+5 more...

OS/ARCH

linux/386

linux/amd64

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VULNERABILITIES

2 C

27 H

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2 C

27 H

12 M

22 L

2 C

27 H

12 M

22 L


COMPRESSED SIZE

49.07 MB

49.01 MB

45.37 MB

docker pull redis:bookworm



TAG

[alpine3.18](#)

Last pushed 8 days ago by [dojianky](#)

DIGEST

af803d7c006e

57b3ebf7bac6

e5fed1a8f461

+5 more...

OS/ARCH

linux/386

linux/amd64

linux/arm/v5

VULNERABILITIES

2 C

27 H

12 M

22 L

2 C

27 H

12 M

22 L

2 C

27 H

12 M

22 L

COMPRESSED SIZE

49.07 MB

49.01 MB

45.37 MB

docker pull redis:alpine3.18

