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"Permission Denied While Trying to Connect to the Docker Daemon Socket" Error [\(/bael-search\)](/bael-search)



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1. Introduction

Owing to their numerous uses, containers have become a buzzword regarding IT infrastructure. One of the most popular container run-times (or container engine) is Docker (Docker run-container) is a container management tool with a sizable developer community.

The permission error occurs when the user does not have the necessary permissions to access the Docker daemon socket.

In this tutorial, we'll explore the causes of this error and provide solutions to fix it, including using `sudo` ([/linux/sudo-i-vs-sudo-su](#)) and adding users to the Docker group.

Without any further ado, let's get into the nitty-gritty details of it.

2. Troubleshooting the Docker Socket Connection Issue

Docker Engine is a complete container runtime environment that includes the Docker CLI, Docker API, and Docker daemon. Further, the Docker daemon is a background process that runs on a host machine; it receives the request from the Docker CLI or client and connects to the Docker API for managing Docker containers, images, volumes, networks, and other Docker objects.

Also, it uses the Unix Network Socket for communicating between the Docker client and daemon:

```
$ docker run ubuntu:latest /bin/bash
docker: Got permission denied while trying to connect to the Docker
 daemon socket at unix://var/run/docker.sock. Post
 "http://%2Fvar%2Frun%2Fdocker.sock/v1.24/containers/create": dial unix
 /var/run/docker.sock: connect: permission denied.
See 'docker run --help'.
$
```

Clients always experience this *"Permission denied while trying to connect to the Docker daemon socket"* error whenever the user doesn't have the appropriate access rights to the Docker daemon socket.

Next, let's see how we can fix this problem.

3. Changing /var/run/docker.sock



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By default, only *root* and the *docker* user group members can access the Docker socket:

```
$ ls -l /var/run/docker.sock
srw-rw---- 1 root docker 0 May 13 06:05 /var/run/docker.sock
```

Some of us may come up with a straightforward "solution" – using the *chmod* (/linux/chown-chmod-permissions) command to modify the permissions of the *sock* file so that any user can read and write to the socket:

```
$ sudo chmod 666 /var/run/docker.sock

$ ls -l /var/run/docker.sock
srw-rw-rw- 1 root docker 0 Mar 13 06:05 /var/run/docker.sock
```

After restarting the Docker service, any user can manage Docker images and start containers. This indeed evades the *"permission denied"* issue:

```
⌘ systemctl restart docker.service
```

```
⌘ docker run -it ubuntu:latest /bin/bash
root@fa679b3875fe:/#
```

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We may think it's convenient for users to start a Docker container. However, **this permission change is potentially dangerous**. An example can explain it quickly.

Let's say we have a user *baeldunguser* in our system. Now, let's start the *Ubuntu* container and mount the host machine's root (*/*) directory as the */host* volume (*/ops/docker-volumes*):

```
baeldunguser$ docker run -it ubuntu:latest /bin/bash
root@fa679b3875fe:/#
```



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As the output above shows, we are now in the container as the *root* user. Now, let's make something in the host machine's root directory as an example, creating a file:

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```
root@fa679b3875fe:/# touch /host/changed-by-docker-container.hello
```

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Then, if we check the host machine, we can see the file is created in the root (*/*) directory:

```
baeldunguser$ ls -l /changed-by-docker-container.hello
-rw-r--r-- 1 root root 0 Jun  3 20:38 /changed-by-docker-container.hello
```

However, only the *root* user is allowed to write to the root (*/*) directory:

```
baeldunguser$ ls -ld /
drwxr-xr-x 19 root root 4096 Jun  3 20:38 /
```

Of course, we don't want to break the system on the host machine. So, we created a file as an example. But we've come to the realization that the *baeldunguser* user has the potential to cause significant damage to the host system through a Docker container.

Therefore, **we shouldn't allow anyone to read and write to the Docker socket daemon.**

Next, let's see the proper solutions to the <https://www.baeldung.com/linux/>

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4. Resolving Permission Errors With Docker and User Privileges

There are multiple ways to resolve this permission issue. Let's start with a temporary solution to solve this problem. **As a quick fix, we can use the *sudo* (superuser do) command in Linux to elevate the privileges or permissions of the user.** It will fix the problem without any issues:

```
$ sudo docker run  
[sudo] password:  
root@5a909c4c61
```



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Now, follow the steps below to permanently resolve the permission issue on accessing the Docker daemon socket.

First, check whether the Docker user group (</linux/check-user-group-privileges/>) is available on the host machine. If not, we can add it using *groupadd* (</linux/managing-users-groups/>) command:

```
$ sudo groupadd docker
```

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```
$ getent group docker  
docker:x:999:
```

```
$ awk -F':' ' !/docker/{print $4}' /etc/group
```

Next, let's add the user to the Docker group, which grants the necessary access rights to the Docker daemon socket:

```
$ sudo usermod -aG docker baeldunguser
```

To make the changes effective, we must log out of the previous session and re-enter the new session after adding the user to the *docker* group:

```
$ getent group docker
docker:x:999:baeldunguser
                (/linux/) (https://www.baeldung.com/linux/)
$ awk -F':' ' /docker/{print $4}' /etc/group
baeldunguser
```

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Lastly, apply the configuration changes by restarting the Docker daemon service using the *systemctl* (/linux/differences-systemctl-service#systemctlcommand) *restart docker.service* command:

```
$ sudo systemctl restart docker.service
$ sudo systemctl status docker.service
• docker.service - Docker Application Container Engine
  Loaded: loaded; vendor
  preset: enabled
  Active: active (running) since 2024-09-01 06:59:00; 2s ago
  Docs: http://docs.docker.com
  Main PID: 10196
  Tasks: 13
  CGroup: /systemd/system/docker.service
           └─10196 /usr/bin/dockerd -H fd:// --
containerd=/run/containerd/containerd.sock
```

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Now, we've successfully executed the Docker commands from the *baeldunguser* userspace with appropriate privileges:

```
$ docker run -it ubuntu:latest /bin/bash
root@fa679b3875fe:/#
```

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5. Conclusion

In this article, we've explored how to temporarily fix the Docker permission issues using the *sudo* command and permanently add the user to the appropriate group.

Overall, by adhering to best deployment practices, users can avoid such common errors and ensure the smooth operation of their Docker environment.

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