

# Lab 1: Introduction to Distributed Databases

## Download the binary

The CockroachDB binary for Linux requires `glibc`, `libcurses`, and `tzdata`, which are found by default on nearly all Linux distributions, with Alpine as the notable exception.

1. Download the CockroachDB v23.1.13 archive as shown below. The archive contains the `cockroach` binary and the supporting libraries that are used to provide `spatial features`. Extract the archive and optionally copy the `cockroach` binary into your `PATH` so you can execute `cockroach` commands from any shell. If you get a permission error, use `sudo`.

```
cd ~/Desktop/

wget https://binaries.cockroachdb.com/cockroach-v23.1.13.linux-amd64.tgz

tar -xvzf cockroach-v23.1.13.linux-amd64.tgz

cd cockroach-v23.1.13.linux-amd64

cp -i cockroach /usr/local/bin
```

2. CockroachDB uses custom-built versions of the `GEOS` libraries. Copy these libraries to one of the locations where CockroachDB expects to find them.

By default, CockroachDB looks for external libraries in `/usr/local/lib/cockroach` or a `lib` subdirectory of the CockroachDB binary's current directory. The instructions below use the `/usr/local/lib/cockroach` location.

1. Create the directory where the external libraries will be stored:

```
mkdir -p /usr/local/lib/cockroach
```

2. Copy the library files to the directory:

```
cp -i lib/libgeos.so /usr/local/lib/cockroach/

cp -i lib/libgeos_c.so /usr/local/lib/cockroach/
```

If you get a permissions error, prefix the command with `sudo`.

3. Verify that CockroachDB can execute spatial queries.

- Make sure the `cockroach` binary you just installed is the one that runs when you type `cockroach` in your shell:

```
which cockroach
```

```
/usr/local/bin/cockroach
```

- Start a temporary, in-memory cluster using `cockroach demo`:

```
cockroach demo
```

- In the demo cluster's interactive SQL shell, run the following command to test that the spatial libraries have loaded properly:

```
SELECT ST_IsValid(ST_MakePoint(1,2));
```

You should see the following output:

```
      st_isvalid
-----
true
(1 row)
```

If your `cockroach` binary is not properly accessing the dynamically linked C libraries in `/usr/local/lib/cockroach`, it will output an error message like the one below.

```
ERROR: st_isvalid(): geos: error during GEOS init: geos: cannot load GEOS from dir
"/usr/local/lib/cockroach": failed to execute dlopen
      Failed running "sql"
```