

# 1 DDMon

DDMon is a deadlock monitoring tool for Erlang and Elixir programs based on the `gen_server` behaviour.

This document contains prerequisites and instructions for building, using, and evaluating DDMon.

**NOTE:** To evaluate the OOPSLA'25 artifact, you can use a Docker-based setup for DDMon. In this case, you can just follow the instructions in the following files, and skip the rest of this file.

- EVALUATION.md for setting up the Docker image, “kicking the tires,” and reproducing the plots and listings in the companion paper.
- EXAMPLE.md to see how DDMon can be used for monitoring applications based on the `gen_server` behaviour.
- SCENARIOS.md for the documentation of the testing DSL used in the paper to benchmark DDMon to various randomised scenarios of varying size.
- IMPLEMENTATION.md for details about the DDMon implementation and how it connects to the theory and results in the companion paper.
- BADGING.md contains overview on how we address requirements for each ACM artifact badge.

**NOTE:** The following build instructions are tested on GNU/Linux (Ubuntu 24.04 and 25.04, and Fedora 42) and macOS.

## 1.1 Hardware dependencies

To execute all benchmarks, the following minimal hardware prerequisites need to be met:

- 32GB of RAM
- 23GB of free disc space
- 8-core CPU (we have tested on 64-bit x86 and M1)

We also provide smaller variants of the largest tests. For those, the following should suffice:

- 16GB of RAM
- 10GB of free disc space
- 4-core CPU

## 1.2 Build prerequisites

- Erlang/OTP, version 26 or higher
- Elixir, version 1.14 or higher
- Mix
- Python 3 with numpy (at least 2.2), pandas (at least 2.2) and matplotlib (at least 3.10) — for plotting benchmark results

### 1.2.1 Optional: script for a fresh local installation of Erlang and Elixir

If you do not have Erlang or Elixir installed, we provide a script that automatically downloads and installs the correct versions. Make sure you have the following build dependencies installed on your system:

- `autoconf`
- `make`
- `libssl-dev`
- `openssl`
- `ncurses`
- `wxWidgets`

To automatically obtain the right versions of Erlang and Elixir, `source` (not run!) the provided script in `bash`:

```
source install-otp.sh
```

This will use asdf version manager to install Erlang and Elixir. If you do not have `asdf` on your system, it shall be installed in the currently visited directory. You may need to run this script in every shell session in order to set up `PATH` correctly.

## 1.3 Building DDMon

To create a local build of DDMon, run:

```
make
```

If you do not have `make`, you can run the following instead:

```
mix deps.get  
mix escript.build
```

## 1.4 Evaluating the OOPSLA'25 artifact

After building DDMon, you can follow the instructions and documentation in the files listed at the beginning of this document, starting with EVALUATION.md — except that you should **remove the Docker-related part of each command**. For example, if EVALUATION.md asks you to run:

```
docker run --rm -v "$(pwd)/output:/app/output" ddmon ./bench.sh small
```

then you should run instead:

```
./bench.sh small
```