

## What is `west` in Zephyr?

`west` is the **meta-tool** provided by the Zephyr Project to manage Zephyr-based projects. Instead of directly calling CMake, Ninja, Git, or other tools individually, `west` acts as a **wrapper** and **orchestrator**. It ensures consistent builds, handles multiple repositories, and simplifies the developer's workflow.

Think of `west` as the command-line assistant for Zephyr projects.

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## What does `west` do?

### 1. Project Management:

2. Manages the Zephyr repository and external modules.
3. Supports fetching code from multiple Git repositories.

### 4. Build Management:

5. Wraps around **CMake** (configuration) and **Ninja/Make** (building).
6. Simplifies builds with a single command instead of manually calling `cmake` and `ninja`.

### 7. Flashing & Debugging:

8. Provides `west flash` and `west debug` to interact with real hardware.
9. Selects the right programmer/debugger backend automatically.

### 10. Running in Emulator (QEMU):

11. With `west build -t run`, binaries are run in **QEMU** without real hardware.
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## Explanation of the `west build` command

Example:

```
west build -b qemu_x86 samples/print-blink -t run
```

Breaking it down:

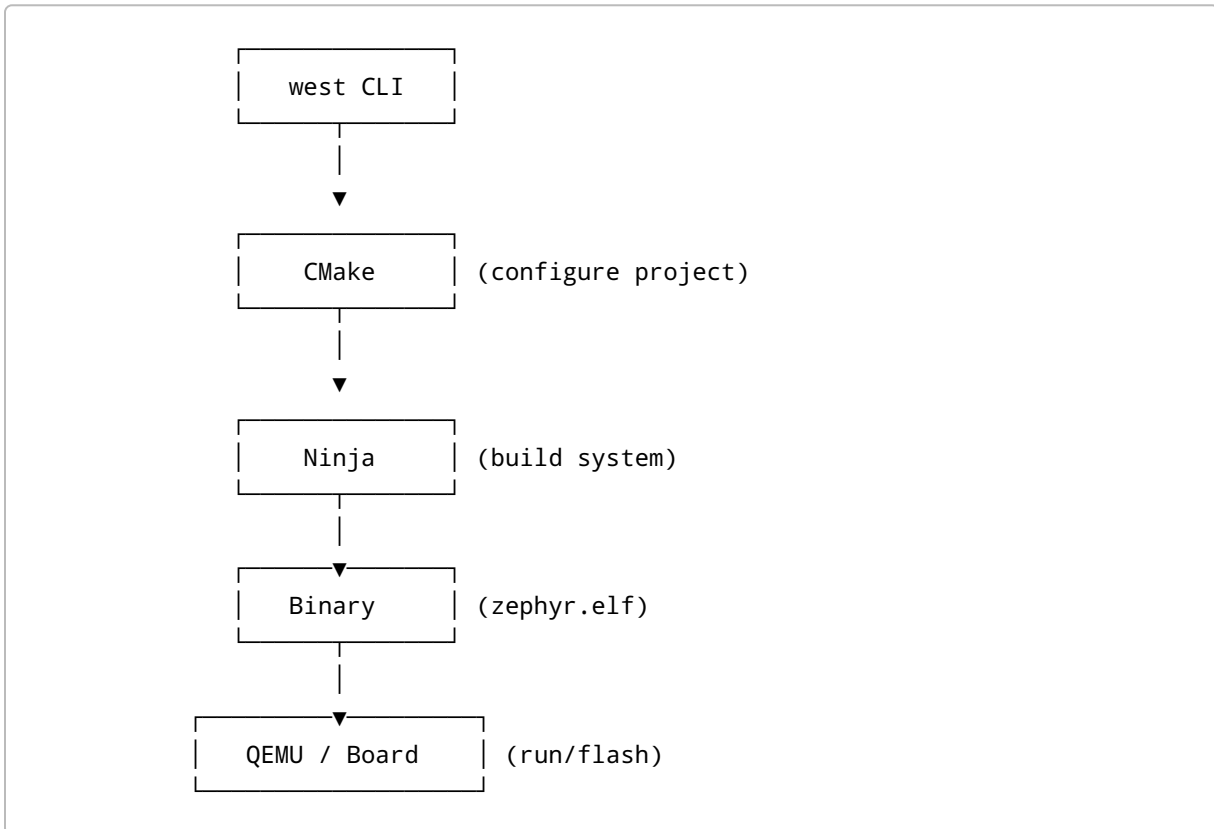
- `west build` → Start a Zephyr build.
- `-b qemu_x86` → Target board is **qemu\_x86** (QEMU emulator for 32-bit x86).

- `samples/print-blink` → Path to the sample application.
- `-t run` → After building, automatically run the application (on QEMU in this case).

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## Workflow Diagram

Here's how the pieces fit together:



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## Summary

- `west` is Zephyr's meta-tool for project and build management.
- It simplifies working with CMake, Ninja, Git, and QEMU.
- Typical command flow:
  - **west build** → runs cmake & ninja → generates binary.
  - **west build -t run** → runs on QEMU.
  - **west flash/debug** → interacts with real hardware.

👉 With `west`, you don't need to manually manage multiple tools. It ensures **consistency**, **automation**, and **ease of use** in Zephyr development.