What is CI/CD, and what does a good pipeline look like?

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CI/CD stands for continuous integration and continuous delivery (or deployment). Continuous integration means merging small changes to a shared branch often and testing each one automatically. Continuous delivery means every passing change is ready to release, with the release itself a routine, low-risk step.

TL;DR The short version

- Continuous integration merges small changes often and tests each automatically; continuous delivery keeps every passing change ready to release.
- A good pipeline builds once, runs fast tests first, scans dependencies and secrets, and gives feedback within minutes.
- The artifact that was tested should be the one released, and CI/CD does not replace code review.

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What is continuous integration?

Developers merge small changes frequently, and each merge triggers an automated build and tests. A conflict or a break is then found within minutes, while the change is still fresh in the author’s mind.

What is the difference between delivery and deployment?

In continuous delivery, a change that passes is ready to go live and a person decides when. In continuous deployment, every passing change goes live automatically, which needs strong tests and a fast way back.

What are the stages of a pipeline?

A typical pipeline builds and packages once, runs fast unit tests first and slower tests later, and scans dependencies, secrets and code. It then promotes the same tested artifact through environments and verifies health after release.

What are the signs of a good pipeline?

Common changes get feedback within minutes, the pipeline is defined as code and reviewed like code, and the artifact that was tested is the artifact that is released. A broken main branch is fixed or reverted before anything else is merged.

Does CI/CD replace code review?

No. Automation checks what can be checked mechanically. People still review design, intent and risk, and the two work best together because the pipeline removes the routine checks from the review.

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Sources and further reading

1. Humble and Farley. Continuous Delivery. Addison-Wesley, 2010.
2. DORA. dora.dev.

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