# Dagger Programmable CI pipelines

## CONCEPTS

Functions run in containers on the Dagger engine, so a pipeline behaves the same on your laptop and in CI.

**Your code** module + SDK
↓ `dagger call`
**CLI** GraphQL API
↓ `session`
**Engine** BuildKit-based
↓ `runs`
**Containers** cached steps

Chain functions on the command line: each returned object exposes its own functions, such as container, directory and file.

Results are cached by content. A step reruns only when its inputs change.

## MODULES

`dagger init --sdk=<go|python|typescript>`
Create a module in this directory

`dagger init --name <name>`
Name the module

`dagger develop`
Regenerate SDK code and bindings

`dagger install <module>`
Add a module as dependency

`dagger install -n <name> <module>`
Install under another name

`dagger update <module>`
Update a dependency

`dagger uninstall <module>`
Remove a dependency

`dagger toolchain install <module>`
Add a toolchain to the module

`dagger init --blueprint=<module>`
Start from a blueprint module

`dagger config`
View or edit module config

## CALL FUNCTIONS

`dagger functions`
List the module's functions

`dagger functions <fn>`
List a function's sub-functions

`dagger call <fn>`
Run a function

`dagger call <fn> --help`
Show a function's arguments

`dagger call <fn> --<arg> <value>`
Pass an argument

`dagger call <fn> <next-fn>`
Chain functions

`dagger call <fn> --source=.`
Pass a local directory

`dagger call <fn> stdout`
Print a container's output

`dagger call <fn> -o <path>`
Save the result to a file or directory

`dagger call <fn> --json`
Print result as JSON

`dagger call <fn> terminal`
Open a shell in the result container

`dagger call -m <ref> <fn>`
Call a module by path or git ref

## SHELL AND API

`dagger`
Open the interactive Dagger shell

`dagger -c "<script>"`
Run a Dagger shell script

`dagger core container from <image>`
Call the core API directly

`dagger core --help`
List core API objects

`dagger run <command>`
Run any program inside a Dagger session

### Shell, call or run?

| Command | Use for |
|---|---|
| `dagger call` | functions in a module |
| `dagger (shell)` | exploring, ad-hoc pipelines |
| `dagger run` | your own SDK script |

## SECRETS

`dagger call <fn> --token=env://<VAR>`
Secret from an env variable

`dagger call <fn> --token=file://<path>`
Secret from a file

`dagger call <fn> --token=cmd://"<command>"`
Secret from a command output

Use the Secret type for tokens and keys, never a plain string argument, so values stay out of logs and traces.

## OUTPUT AND DEBUG

`dagger call -i <fn>`
Shell into a failing exec

`dagger call -v <fn>`
More detail (-vv, -vvv for more)

`dagger call -s <fn>`
Hide progress entirely

`dagger call --progress=plain <fn>`
Plain log output for CI

## RECIPES

### Create and run a Go module

```
dagger init --sdk=go --name=ci
dagger functions
dagger call container-echo --string-arg hi stdout
```

### Test and build in CI

```
dagger call --progress=plain test --source=.
dagger call build --source=. export --path=./bin/app
```

### Build a container and publish

```
dagger call build --source=. \
  publish --address=ghcr.io/<org>/<app>:latest
```

### Pass a token from the environment

```
export GH_TOKEN=<token>
dagger call deploy --token=env://GH_TOKEN
```

## HELP

`dagger --help`
List all commands and flags