Go Go toolchain commands

CONCEPTS

A module (go.mod) is a tree of packages; a package is one directory of .go files. Commands take package patterns: . is the current package, ./... is it plus everything below.

Module go.mod, versioned unit
Package one directory, one import path
.go file declarations; _test.go for tests

Module, package and file

go build only checks and discards non-main packages; for a main package it writes a binary. go install puts the binary in $GOBIN (default $GOPATH/bin).

go.sum holds checksums of dependencies: commit it together with go.mod.

BUILD AND RUN

`go run .`
Compile and run the package here

`go run <file.go> <args>`
Run files, passing program args

`go build ./...`
Compile all packages, discard results

`go build -o <path> .`
Write the binary to a chosen path

`go install <pkg>@latest`
Install a tool binary into $GOBIN

`go build -race`
Build with the race detector

`go build -ldflags="-s -w"`
Strip symbols and debug info

`go build -ldflags="-X main.version=<v>"`
Set a string variable at link time

`go build -tags <tag,...>`
Enable build tags

`go build -trimpath`
Remove local paths from the binary

BUILD AND RUN (cont.)

`go clean -cache`
Delete the build cache

`go clean -testcache`
Expire cached test results

CROSS-COMPILING

`GOOS=<os> GOARCH=<arch> go build`
Build for another platform

`go tool dist list`
List supported GOOS/GOARCH pairs

`CGO_ENABLED=0 go build`
Static build without C toolchain

TESTING

`go test`
Test the package in the current dir

`go test ./...`
Test every package below here

`go test -v`
Print each test and its output

`go test -run <regexp>`
Run only matching tests

`go test -count=1`
Bypass the test result cache

`go test -race`
Run with the race detector

`go test -short`
Skip tests that check testing.Short()

`go test -failfast`
Stop after the first failure

`go test -timeout <d>`
Abort a test binary after d

`go test -skip <regexp>`
Skip matching tests

`go test -cover`
Show statement coverage

`go test -coverprofile=<file>`
Write a coverage profile

`go tool cover -html=<file>`
Browse coverage in a browser

`go test -bench <regexp>`
Run benchmarks (. for all)

FORMAT AND CHECK

`go fmt ./...`
Format files with gofmt -l -w

`go vet ./...`
Find likely mistakes

`go doc <pkg>[.<Symbol>]`
Show docs for a package or symbol

DEPENDENCIES

`go get <pkg>`
Add a dependency at the latest version

`go get <pkg>@<version>`
Pin a version, branch or commit

`go get -u ./...`
Upgrade deps of this module

`go list -m all`
List all modules in the build

`go list -m -u all`
Show modules with available updates

MODULES

`go mod init <module>`
Create go.mod here

`go mod tidy`
Add missing, remove unused modules

`go mod edit -replace <old>=<new>`
Add a replace directive

WORKSPACES

`go work init <dir>...`
Create go.work for local modules

`go work use <dir>`
Add a module to the workspace

ENVIRONMENT

`go version`
Print the Go toolchain version

`go env`
Print all Go environment settings

`go env -w <VAR>=<value>`
Persist a setting