buf Protobuf toolkit

START HERE

`buf config init`
Create buf.yaml

`buf breaking --against <input>`
Detect breaking changes

`buf build`
Compile and check protos

`buf generate`
Generate code

`buf lint`
Check style rules

`buf dep update`
Pin dependencies

`buf format -w`
Format files in place

`buf curl <url>`
Call an RPC

proto files buf.yaml module → `buf lint / format` → **Checked source** style ok → `buf breaking` → **Compatible** vs. last release → `buf generate` → **Generated code** buf.gen.yaml

CONCEPTS

buf reads buf.yaml for modules, lint and breaking rules, and buf.gen.yaml for code generation. Inputs default to the current directory.

An input can be a directory, a git ref, a tarball, an image file or a BSR module: the same argument works for build, lint, breaking and generate.

Config is v2 (version: v2). Run buf config migrate to upgrade an older v1 buf.yaml and buf.gen.yaml.

SETUP AND CONFIG

`buf --version`
Print the installed version

`buf config init`
Create a buf.yaml here

`buf config ls-lint-rules`
List available lint rules

`buf config ls-breaking-rules`
List available breaking rules

`buf config ls-modules`
List modules in the workspace

`buf config migrate`
Upgrade config files to v2

`buf <command> --help`
Help for any command

BUILD

`buf build`
Compile all protos in the module
Fails with the same errors protoc would report; a quick sanity check in CI.

`buf build -o image.binpb`
Write a binary image

`buf build --as-file-descriptor-set -o fds.binpb`
Write a plain FileDescriptorSet

`buf build --path <dir/file.proto>`
Build only part of the module

`buf build --type <pkg.Message>`
Keep only one type and its deps

LINT

`buf lint`
Lint the current module

`buf lint <input>`
Lint a dir, git ref or image

LINT (cont.)

`buf lint --path <file.proto>`
Lint selected files only

`buf lint --exclude-path <path>`
Skip files or directories

`buf lint --error-format github-actions`
Annotations for GitHub Actions

`buf lint --error-format json`
Machine-readable violations

`buf lint --error-format config-ignore-yaml`
Print ignore_only YAML for violations
Paste the output into buf.yaml to baseline existing violations.

Lint categories

Category	Meaning
`STANDARD`	Default, recommended rules
`BASIC`	Smaller subset of STANDARD
`MINIMAL`	Package layout only
`COMMENTS`	Require comments (opt in)
`UNARY_RPC`	Forbid streaming RPCs (opt in)

`// buf:lint:ignore <RULE_ID>`
Silence one rule above a line
Place it directly before the element; disallow_comment_ignores: true turns it off.

FORMAT

`buf format`
Print formatted files to stdout

`buf format -w`
Rewrite files in place

`buf format -d`
Show a diff instead

`buf format -d --exit-code`
Fail if anything is unformatted (CI)

BREAKING CHANGES

`buf breaking --against '.git#branch=main'`
Compare with main in git

`buf breaking --against <dir>`
Compare with another directory

`buf breaking --against image.binpb`
Compare with a saved image

`buf breaking --against-registry`
Compare with the latest BSR commit

BREAKING CHANGES (cont.)

`buf breaking --against <input> --path <dir>`
Check only part of the module

`buf breaking --against <input> --error-format github-actions`
Annotations for CI

Breaking categories

Category	Catches changes that break
`FILE`	Generated source per file (default)
`PACKAGE`	Generated source per package
`WIRE_JSON`	Wire and JSON encoding
`WIRE`	Wire encoding only

`buf build -o baseline.binpb`
Save a baseline image of a release

GENERATE

`buf generate`
Run plugins from buf.gen.yaml

`buf generate --template <file.yaml>`
Use another template file

`buf generate --path <dir>`
Generate for part of the module

`buf generate --include-imports`
Also generate code for imports
Well-known types are not included.

`buf generate --clean`
Delete plugin output dirs first

`buf generate <input>`
Generate from a git repo or module

DEPENDENCIES AND MODULES

`buf dep update`
Resolve deps and write buf.lock

`buf export <input> -o <dir>`
Copy protos and deps into a dir

CONVERT AND CALL

`buf convert <input> --type <pkg.Msg> --from <file>.json --to <file>.binpb`
Convert a message between formats

`buf curl --list-services <url>`
List services via reflection

`buf curl --list-methods <url>`
List methods via reflection

CONVERT AND CALL (cont.)

`buf curl -d '<json>' <url>/<pkg.Svc>/<Method>`
Call an RPC with a JSON body

`buf curl -d @<file>.json <url>/<pkg.Svc>/<Method>`
Read the body from a file

`buf curl --schema <dir> <url>/<pkg.Svc>/<Method>`
Use local protos, no reflection

`buf curl --protocol grpc <url>/<pkg.Svc>/<Method>`
Speak gRPC (default is Connect)

`buf curl -H "Authorization: Bearer <token>" <url>/<pkg.Svc>/<Method>`
Send a header

`buf curl --http2-prior-knowledge <url>/<pkg.Svc>/<Method>`
Plaintext HTTP/2 (h2c)

`buf curl -v <url>/<pkg.Svc>/<Method>`
Show request and response details

CONFIG FILES

buf.yaml

```
version: v2
modules:
  - path: proto
deps:
  - buf.build/googleapis/googleapis
lint:
  use:
    - STANDARD
  except:
    - PACKAGE_VERSION_SUFFIX
breaking:
  use:
    - FILE
```

buf.gen.yaml

```
version: v2
clean: true
plugins:
  - remote: buf.build/protocolbuffers/go
    out: gen/go
    opt: paths=source_relative
  - local: protoc-gen-go-grpc
    out: gen/go
inputs:
  - directory: proto
```

RECIPES

CI checks

```
buf format -d --exit-code
buf lint
buf build
buf breaking --against '.git#branch=main'
```

Fresh code generation

```
buf dep update
buf generate --clean
git diff --exit-code gen/
```