.NET CLI dotnet SDK commands

CONCEPTS

Build, run, test and publish restore NuGet packages first, so a separate restore is rarely needed.

Source .cs + .csproj
↓ restore
Packages obj/project.assets.json
↓ build
Binaries bin/<config>/<tfm>
↓ publish
Deploy folder bin/.../publish

Without a path argument, commands pick the one project or solution file in the current folder; with several, name one.

Arguments the app should get go after a literal --: dotnet run -- --help.

CREATE

dotnet new list
List installed templates

dotnet new console -o *<name>*
New console app in a folder

dotnet new classlib -o *<name>*
New class library

dotnet new webapi -o *<name>*
New ASP.NET Core web API

dotnet new xunit -o *<name>*
New xUnit test project

dotnet new sln
New solution file

BUILD AND RUN

dotnet build
Compile the project or solution

dotnet build -c Release
Build in Release configuration

dotnet run
Build and run the project

dotnet run --project *<path>*
Run a project from elsewhere

dotnet run -- *<args>*
Pass arguments to the app

dotnet watch
Rerun or hot reload on change

TEST

dotnet test
Build and run all tests

dotnet test --filter *<expr>*
Run only matching tests

dotnet test --filter "Name~*<text>***"**
Match by test name

dotnet test -l "console;verbosity=detailed"
Show each test result

dotnet test --collect "XPlat Code Coverage"
Collect coverage with Coverlet

PACKAGES AND REFERENCES

dotnet add package *<id>*
Add a NuGet package

dotnet add package *<id>* **-v** *<version>*
Add a specific version

dotnet remove package *<id>*
Remove a package

dotnet list package
List referenced packages

dotnet list package --outdated
Show newer versions

dotnet list package --vulnerable
Show known vulnerabilities

dotnet add reference *<csproj>*
Reference another project

SOLUTIONS

dotnet sln add *<csproj>*
Add a project to the solution

PUBLISH

dotnet publish -c Release
Publish for deployment

dotnet publish -o *<dir>*
Publish into a folder

dotnet publish -r *<rid>* **--self-contained**
Bundle the runtime

dotnet publish -p:PublishSingleFile=true
One-file executable

TOOLS AND FORMAT

dotnet tool install -g *<id>*
Install a global tool

dotnet tool install *<id>*
Install a local (repo) tool

dotnet tool restore
Install tools from the manifest

dotnet format
Apply .editorconfig style fixes

dotnet format --verify-no-changes
CI check, fails if changes needed

SDK AND WORKLOADS

dotnet --info
SDK, runtime and OS details

dotnet --version
SDK version in use

dotnet --list-sdks
Installed SDKs

dotnet --list-runtimes
Installed runtimes

dotnet *<command>* **-h**
Help for any command

global.json in a parent folder pins the SDK version dotnet picks; otherwise the newest installed SDK is used.

RECIPES

New app with tests in a solution

```
dotnet new sln -n App
dotnet new console -o src/App
dotnet new xunit -o tests/
App.Tests
dotnet sln add src/App tests/
App.Tests
dotnet add tests/App.Tests
reference src/App/App.csproj
dotnet test
```

CI pipeline steps

```
dotnet restore
dotnet format --verify-no-changes
--no-restore
dotnet build -c Release --no-
restore
dotnet test -c Release --no-build
```

Single-file Linux binary

```
dotnet publish -c Release -r
linux-x64 \
  --self-contained -
p:PublishSingleFile=true \
  -o out
```