TypeScript compiler (tsc) Typed JS compiler

CONCEPTS

tsc finds tsconfig.json by walking up from the current directory. Naming files on the command line makes it refuse to run unless you add --ignoreConfig.

tsconfig.json options + files
↓ tsc
Type check errors, exit code 1
↓ emit
JavaScript outDir

Type errors do not stop emit unless noEmitOnError is set. A non-zero exit code only tells you there were errors.

These entries describe TypeScript 7 (native compiler). 7 removed baseUrl, target es5 and moduleResolution node10, and made strict the default. On 5.x, check with tsc --version.

PROJECT SETUP

tsc --init
Create a tsconfig.json

tsc
Compile using the nearest tsconfig.json

tsc -p *<path>*
Compile a config file or directory

tsc --noEmit
Type-check without writing files

tsc --watch
Recompile when files change

tsc --ignoreConfig *<file>*
Compile given files, ignore tsconfig

tsc --version
Show the compiler version

tsc --help --all
List every compiler option

TSCONFIG KEYS

"extends": "*<file>*"
Inherit another config

"include": ["src"]
Files to compile

"exclude": ["dist"]
Files to skip

TSCONFIG KEYS (cont.)

"references": [{"path": "*<dir>*"}]
Link another project

"compilerOptions": {}
Where all options below go

LANGUAGE & MODULES

--target esnext
Syntax level of emitted JS

--module nodenext
Module format for Node projects

--module preserve
Keep imports as written (bundlers)

--moduleResolution bundler
Resolution for bundler setups

--lib *<list>*
Built-in type libraries to include

--types *<list>*
Which @types packages to load

--jsx react-jsx
How JSX is compiled

--resolveJsonModule
Allow importing .json files

--allowJs
Include .js files in the project

"paths": {"@/*": ["./src/*"]}
Alias import prefixes

TYPE CHECKING

--strict
Enable all strict checks

--noUncheckedIndexedAccess
Indexed access may be undefined

--noImplicitReturns
Every code path must return

--noUnusedLocals
Error on unused variables

--noUnusedParameters
Error on unused parameters

--skipLibCheck
Skip checking .d.ts files

EMIT

--outDir *<dir>*
Write output files here

EMIT (cont.)

--rootDir *<dir>*
Root of the input tree

--declaration
Emit .d.ts files

--emitDeclarationOnly
Emit only .d.ts files

--sourceMap
Emit .js.map files

--noEmitOnError
Emit nothing if there are errors

--verbatimModuleSyntax
Keep imports/exports as written

--isolatedModules
Require per-file safe code

PROJECTS & BUILDS

tsc --build
Build projects whose inputs changed

tsc -b --watch
Rebuild referenced projects on change

tsc -b --clean
Delete build outputs

--incremental
Cache state in .tsbuildinfo

DEBUGGING

tsc --showConfig
Print the final merged config

tsc --listFiles
List every file in the program

tsc --listFilesOnly
List files and stop

tsc --explainFiles
Why each file was included

tsc --traceResolution
Log module lookup steps

RECIPES

Minimal Node tsconfig

```
{
  "compilerOptions": {
    "module": "nodenext",
    "target": "esnext",
    "outDir": "dist",
    "types": ["node"],
    "skipLibCheck": true
  },
  "include": ["src"]
}
```