esbuild Fast JS bundler

START HERE

`esbuild app.ts --bundle --outfile=out.js`
Bundle to one file

`esbuild app.ts --bundle --watch`
Rebuild on change

`esbuild app.ts --bundle --minify`
Minified bundle to stdout

`esbuild app.ts --bundle --servedir=www`
Dev server

`esbuild app.ts --bundle --outdir=dist`
Write into a directory

`esbuild app.ts --bundle --platform=node`
Target Node

`esbuild app.ts --bundle --sourcemap`
Emit a source map

`esbuild --version`
Show version

Entry points app.ts, ... → `resolve` → **Module graph** imports, packages → `loader + target` → **Transformed** TS/JSX to JS, minify → `format` → **Output** --outfile / --outdir

CONCEPTS

> Without --bundle esbuild only transforms each file (TS/JSX to JS) and does not follow imports. With no --outfile it prints to stdout.

> Flag forms: --flag, --flag=value for single values, --flag:key=value for repeatable ones (--loader:.png=file, --external:react).

> Quote globs like "src/**/*.ts" so esbuild expands them instead of your shell.

BUILD

`esbuild <entry> --bundle --outfile=<file>`
Bundle one entry into a file

`esbuild <a> <b> --bundle --outdir=<dir>`
Bundle several entries into a directory

`--minify`
Minify whitespace, syntax and names

`--sourcemap`
Write a linked .map file

`--sourcemap=inline`
Embed the source map as a data URL

`--sourcemap=external`
Write the map without a comment link

`--sources-content=false`
Leave source text out of the map

`--outbase=<dir>`
Root for mirroring entry paths in outdir

`--tsconfig=<file>`
Use this tsconfig instead of discovery

PLATFORM AND FORMAT

`--platform=browser|node|neutral`
Pick target environment (default browser)

`--format=iife|cjs|esm`
Output module format
Bundled default: iife for browser, cjs for node, esm for neutral. Not bundling: input format is kept.

PLATFORM AND FORMAT (cont.)

`--target=es2020,chrome100`
Lower syntax for these engines
Syntax only: esbuild does not polyfill APIs. Default is esnext.

`--external:<pkg>`
Leave a module out of the bundle

`--packages=external`
Keep every package import external

`--splitting --format=esm --outdir=<dir>`
Share code between entries in chunks

`--global-name=<name>`
Global variable name for iife output

`--chunk-names=<template>`
Name split chunks, e.g. [name]-[hash]

LOADERS AND ASSETS

`--loader:.<ext>=<loader>`
Choose how a file type is read

`--loader:.png=dataurl`
Inline images as data URLs

`--loader:.png=file`
Copy asset and import its path

`--loader:.js=jsx`
Allow JSX in .js files

`--jsx=automatic`
Use the React 17+ JSX runtime

`--jsx-factory=<fn>`
Function that JSX compiles to

`--jsx-import-source=<pkg>`
Package for the automatic JSX runtime

`--asset-names=<template>`
Name for copied file-loader assets

`--entry-names=<template>`
Output name pattern for entries

`--public-path=<url>`
Prefix for file-loader URLs

`--out-extension:.js=.mjs`
Use a different output extension

`--inject:<file>`
Prepend a file and replace globals from it

`--banner:js=<text>`
Add text at top of JS output

OPTIMIZE

`--define:<name>=<value>`
Replace an identifier with a constant
Value must be JSON or an identifier; strings need inner quotes: --define:ENV=\"prod\"

`--define:process.env.NODE_ENV=\"production\"`
Set NODE_ENV for dead-code removal

`--drop:console`
Remove console.* calls

`--drop:debugger`
Remove debugger statements

`--pure:<fn>`
Treat calls as side-effect free

`--minify-whitespace`
Minify only whitespace

`--minify-syntax`
Minify only syntax

`--minify-identifiers`
Minify only names

`--keep-names`
Keep function and class .name

`--tree-shaking=true`
Force tree shaking on, even unbundled

`--legal-comments=<mode>`
none, inline, eof, linked or external

`--charset=utf8`
Write non-ASCII characters unescaped

WATCH AND SERVE

`--watch`
Rebuild when inputs change
Stops when stdin closes, so it exits in some CI or script setups.

`--watch=forever`
Keep watching after stdin closes

`--servedir=<dir>`
Serve a directory plus build output

`--serve=<port>`
Serve build output on a port
Default port is the first free one of 8000-8009. For development only.

`--serve-fallback=<file>`
Serve this page instead of a 404

`--keyfile=<key> --certfile=<cert>`
Serve over HTTPS

ANALYZE AND LOGS

`--metafile=<file>`
Write build metadata JSON

`--analyze`
Print a size report of the bundle

`--analyze=verbose`
Detailed report with import chains

`--log-level=<level>`
verbose|debug|info|warning|error|silent

`--log-limit=<n>`
Max messages shown (default 6, 0 = all)

RESOLUTION

`--alias:<from>=<to>`
Rewrite an import path or package
Replacement resolves from the working directory.

`--conditions=<names>`
Extra package exports conditions

TRANSFORM STDIN

`esbuild --loader=ts < <in.ts>`
Transform TypeScript from stdin

`echo '<code>' | esbuild --minify`
Minify a quick snippet

RECIPES

Production browser bundle

```
esbuild src/index.ts --bundle --minify --sourcemap \
  --target=es2020 --define:process.env.NODE_ENV=\"production\" \
  --outfile=dist/app.js
```

Node CLI with dependencies external

```
esbuild src/cli.ts --bundle --platform=node --target=node20 \
  --packages=external --format=esm --outfile=dist/cli.mjs
```

Dev loop with live static server

```
esbuild src/index.tsx --bundle --jsx=automatic --sourcemap \
  --servedir=public --outdir=public/js --watch
```

Find what makes the bundle big

```
esbuild src/index.ts --bundle --minify --metafile=meta.json \
  --outfile=/dev/null --analyze
```