Nx Monorepo build system

START HERE

`npx nx <target> <project>`
Run one task

`nx show projects`
List projects

`nx run-many -t build`
Run in all projects

`nx g <plugin>:<generator>`
Scaffold code

`nx affected -t test`
Only what changed

`nx reset`
Clear cache and daemon

`nx graph`
See the project graph

`nx <target> <project> --skipNxCache`
Bypass the cache

Project graph projects + deps → **`target deps`** → **Task graph** what to run → **`hash inputs`** → **Cache** hit: replay → **`miss: run`** → **Run** parallel

CONCEPTS

A project has targets (build, test, ...). Nx runs a target, replays cached output when inputs are unchanged, and runs dependencies first.

Without a global install use npx nx, pnpm nx or yarn nx; the workspace version is used.

Task flags not known to Nx can be passed after the project: nx test web --watch.

RUN TASKS

`nx run <project>:<target>`
Run one target

`nx <target> <project>`
Shorthand for run

`nx run <p>:<t>:<config>`
Use a configuration

`nx <target> <project> -c <config>`
Set configuration by flag

`nx run-many -t <target>`
Run a target everywhere

`nx run-many -t <t1> <t2>`
Run several targets

`nx run-many -t <target> -p <a> <b>`
Limit to projects

`nx run-many -t <target> -p "tag:<tag>"`
Select projects by tag

`nx run-many -t <target> --exclude <p>`
Skip projects

`nx affected -t <target>`
Only affected projects

`nx affected -t <target> --base=<ref> --head=<ref>`
Compare two refs

`nx affected -t <target> --uncommitted`
Include local edits

`nx affected -t <target> --explain=stdout`
Why was it affected

`--parallel=<n>`
Max concurrent tasks (default 3)

`--parallel=false`
Run one task at a time

RUN TASKS (cont.)

`--nxBail`
Stop after first failure

`--outputStyle=<style>`
tui, stream, static, summary

`--graph`
Show the task graph, no run

`nx watch --all -- <cmd>`
Rerun a command on change

INSPECT

`nx graph`
Open the project graph

`nx graph --focus=<project>`
One project and neighbours

`nx graph --affected`
Highlight affected

`nx graph --view=tasks --targets=<t>`
Task graph view

`nx graph --file=<out>.json`
Write graph to file

`nx show projects`
List projects

`nx show projects --withTarget=<t>`
Projects with a target

`nx show projects --type=<app|lib|e2e>`
Filter by type

`nx show projects --affected`
Only affected ones

`nx show project <project>`
Resolved project config

`nx show target inputs <project>:<t>`
What feeds the hash

`nx show target outputs <project>:<t>`
What gets cached

`nx list`
Installed plugins

`nx list <plugin>`
Plugin generators and executors

GENERATE AND SET UP

`nx g <plugin>:<generator> <name>`
Run a generator

`nx g <plugin>:<generator> --dry-run`
Preview file changes

GENERATE AND SET UP (cont.)

`nx g @nx/js:library <name>`
New library

`nx add <package>`
Install and set up a plugin

`nx init`
Add Nx to an existing repo

`nx sync`
Run sync generators

`nx sync:check`
Fail if out of sync (CI)

`nx format:write`
Format affected files

`nx format:check`
Check formatting (CI)

`nx migrate latest`
Plan an upgrade

`nx migrate --runMigrations`
Apply migrations.json

`nx migrate latest --createCommits`
Commit per migration

CACHE AND DAEMON

`nx reset`
Clear cache, daemon, graph data

`nx reset --onlyCache`
Clear only local cache

`nx reset --onlyDaemon`
Restart the daemon

`--skipNxCache`
Bypass local cache for a run

`--skipRemoteCache`
Bypass remote cache

`NX_DAEMON=false`
Disable daemon for a run

`nx connect`
Connect to Nx Cloud

A cache hit replays terminal output and restores outputs. Stale results usually mean inputs are missing from the hash.

CONFIG FILES

`project.json: targets`
Per-project task definitions

`project.json: tags`
Labels for tag: selectors

CONFIG FILES (cont.)

`targets.<t>.executor`
What the task runs

`targets.<t>.command`
Plain shell command

`targets.<t>.dependsOn`
Tasks that run first

`"^build" in dependsOn`
Same target in dependencies

`targets.<t>.inputs`
Files and vars that affect hash

`targets.<t>.outputs`
Paths to cache

`targets.<t>.cache: true`
Make a target cacheable

`targets.<t>.configurations`
Named option sets

`nx.json: targetDefaults`
Shared target settings

`nx.json: namedInputs`
Reusable input groups

`nx.json: plugins`
Inferred targets from tools

`nx.json: defaultBase`
Base branch for affected

`nx.json: nxCloudId`
Remote cache workspace

RECIPES

nx.json defaults

```
{
  "defaultBase": "main",
  "targetDefaults": {
    "build": {
      "dependsOn": ["^build"],
      "cache": true,
      "outputs":
["{projectRoot}/dist"]
    },
    "test": { "cache": true }
  }
}
```

CI: only what a PR touched

```
nx affected -t lint test build
--base=origin/main
# shallow clones hide history:
# fetch full history (fetch-
depth: 0)
```

Upgrade Nx

```
nx migrate latest
npm install
nx migrate --runMigrations
# review diff, then delete
migrations.json
```

Debug a stale cache

```
nx show target inputs
<project>:build
nx build <project> --skipNxCache
nx reset
```