Angular Upgrade Guide: v15 → v18

Section 1: Angular v15 Baseline

Ensure your project is running Angular v15 before starting the upgrade path. Baseline requirements: - TypeScript 4.8+ - Node.js 14 or 16 - Angular CLI v15 - ngcc migration completed (Ivy enabled) Familiarize with new v15 features such as metaprogramming APIs and turbo-enabled build pipelines.

Section 2: Upgrade v15 → v16

Angular v16 introduces removal of ngcc, partial compilation support, and experimental signals. Prerequisites: - Ensure TypeScript is upgraded to 4.9 or above - Update Node.js to 16 or 18 (recommended) Upgrade Steps: 1. Run `ng update @angular/core@16 @angular/cli@16` 2. Confirm removal of ngcc in postinstall scripts 3. Test Ivy compilation without ngcc: `ng build` 4. Opt-in to signals preview by importing `@angular/core/rxjs-interop` 5. Update tsconfig to include "defineSignal" options if using signals 6. Execute unit and E2E tests 7. Address any breaking changes (e.g., library legacy ViewEngine removal)

Section 3: Upgrade v16 → v17

Angular v17 stabilizes control flow directives and esbuild-based builds. Prerequisites: - TypeScript 5.2+ - Node.js 18+ Upgrade Steps: 1. Run `ng update @angular/core@17 @angular/cli@17` 2. Address Type-only directive migration warnings for *ngIf and *ngFor 3. Update builders to esbuild by default, remove custom webpack configs if unused 4. Refactor any deprecated lifecycle hooks and remove renderComponent polyfills 5. Re-run tests and fix any template type errors (strict mode) 6. Verify production build size and performance improvements

Section 4: Upgrade v17 → v18

Angular v18 makes signals stable and previews zoneless mode. Prerequisites: - TypeScript 5.4+ - Node.js 18 or 20 Upgrade Steps: 1. Run `ng update @angular/core@18 @angular/cli@18` 2. Migrate to stable signals API if using preview signals 3. Experiment with zoneless mode via `import '@angular/platform-browser/zone-less';` 4. Update tsconfig.json for useNgDevMode flags and enable emitZone configurations 5. Remove any legacy Zone.js shims if opting into zoneless 6. Perform end-to-end testing for change detection boundaries 7. Validate SSR hydration improvements if applicable

Summary and Next Steps

After completing to v18, continue with sequential updates to v19 and v20. Perform incremental testing after each version upgrade, maintain version control branches, and leverage ng update schematics for safe migrations.