

Syntax-Directed Editing - Executive Brief

Architecture Modules:

- grammar-core: BNF parser, LR tables, linting
- ttlr: Threaded-Tree LR parser with lazy NCA
- attrib-engine: Replace/Propagate DAG scheduler
- pretty/unparse: span-based minimal repaint
- ui-shell: dual view editor, undo/redo log

KPI Targets:

- Edit latency P95 < 20 ms for $y' \leq 64$ tokens
- Semantic re-eval $O(|\text{Affected}|)$ per Replace
- $\geq 90\%$ node reuse for local edits

Risk & Mitigation:

- Ambiguity spikes \rightarrow GLR fallback, precedence rules
- Attribute cycles \rightarrow DAG cycle detection + diagnostics
- Deep graft cost \rightarrow Budgeted NCA + local reparse