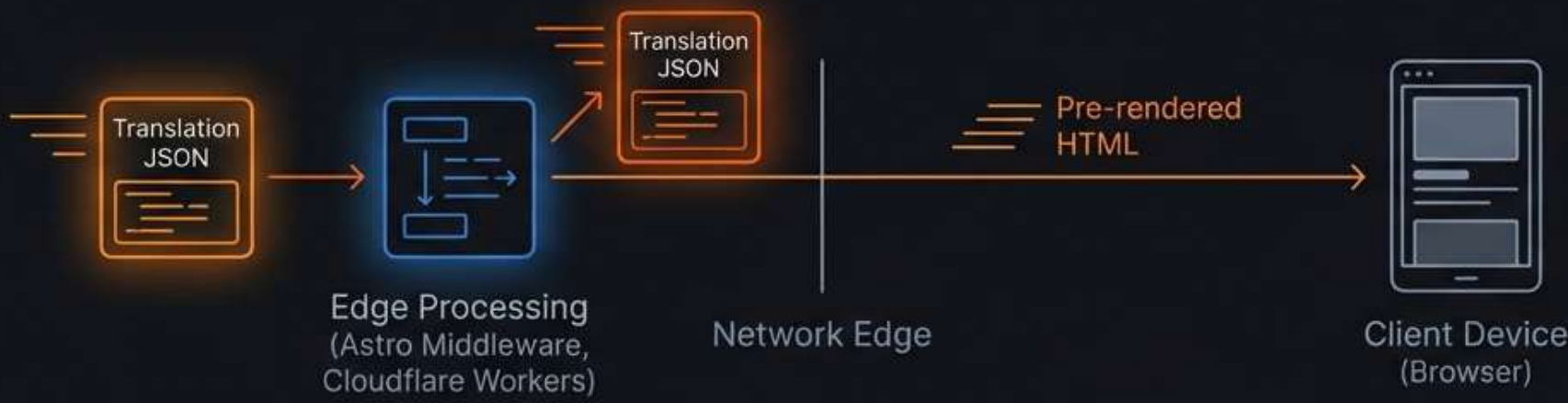
Stop Shipping Translation JSON to the Client

Implementing Edge-native i18n using Astro Middleware and Cloudflare Workers



Architecture Overview • 0KB Client JS

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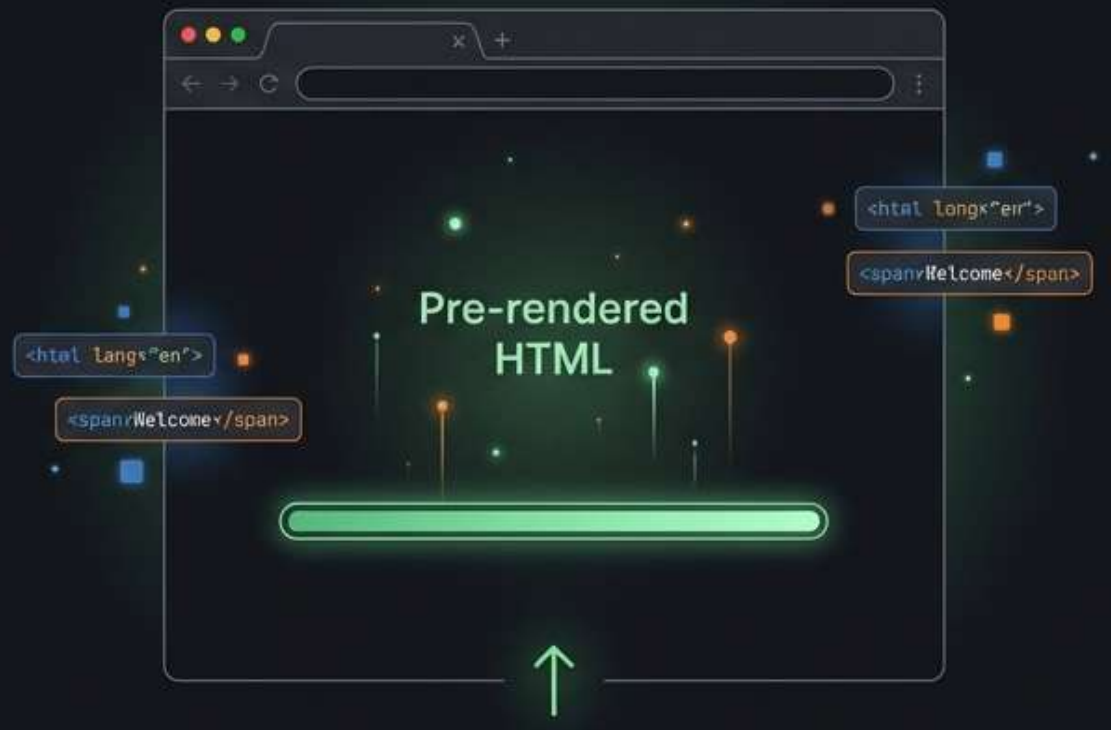
The Bottleneck: The Cost of Client-Side i18n

Traditional Client-Side

Edge-Native



Payload Bloat:
Sending unused strings to the browser.

Blocked Hydration:
Parsing large JSON before interactivity.

Layout Shifts:
UI flickers as dictionaries load late.

Network Waste:
High bandwidth on low-end devices.

The Paradigm Shift: Zero-JS, Edge-Native i18n

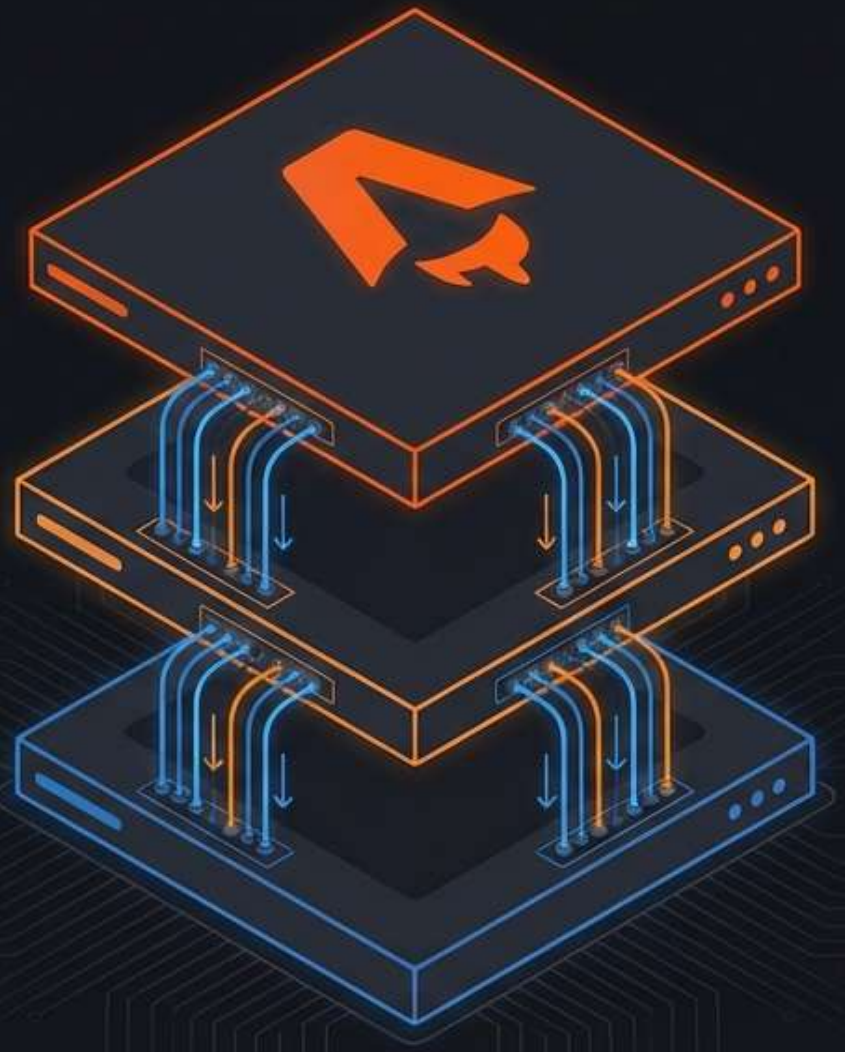
No client bundles, no hydration—all rendering happens at the edge.

The Architectural Stack

Astro
Middleware routing & Server-Side Rendering.

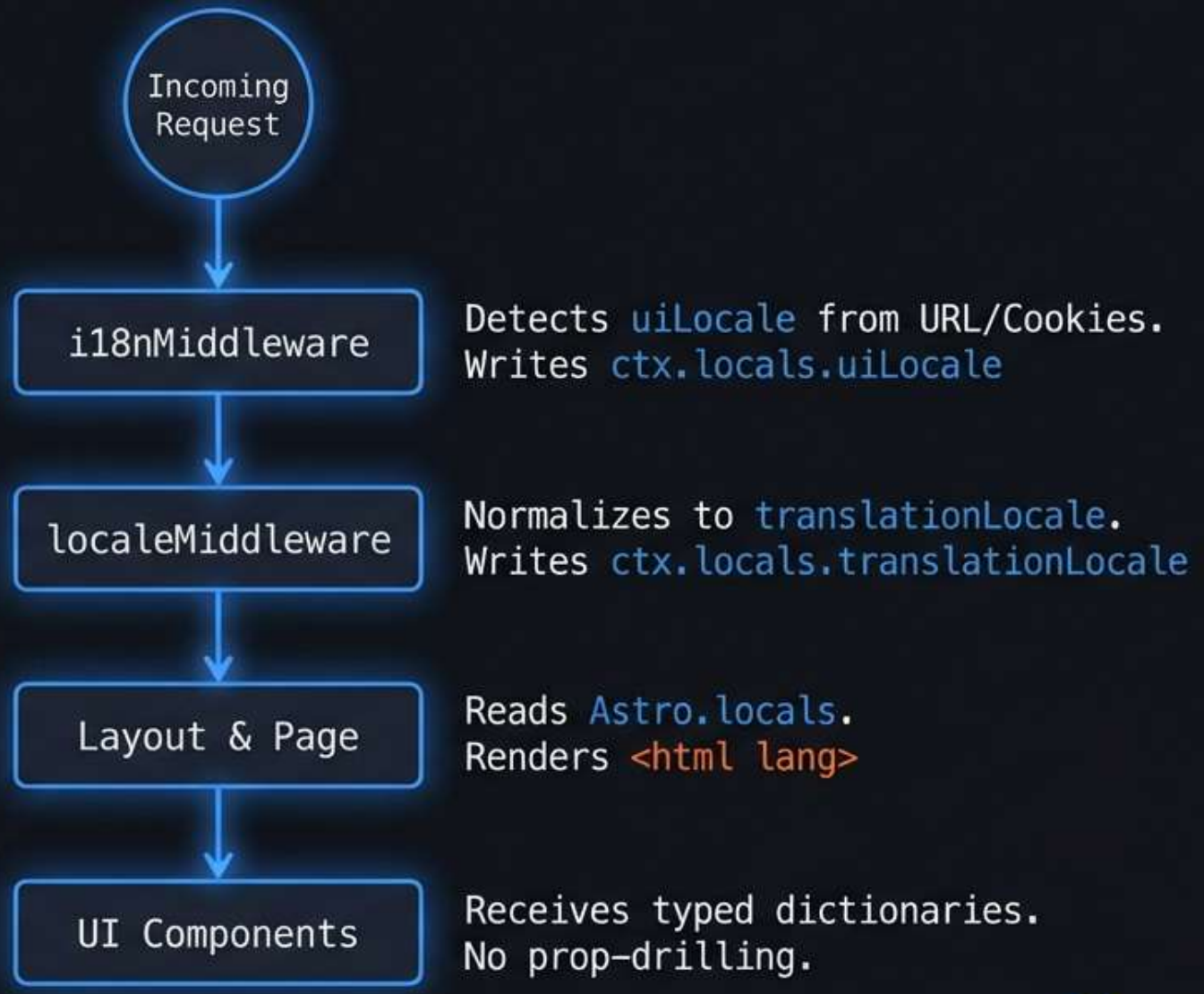
Cloudflare Workers
Serverless Runtime Environment.

Cloudflare KV
High-speed Global Key-Value Storage.



Type Generation

The Request Pipeline: Middleware Logic



Storage Strategy: Cloudflare KV Integration

`<PROJECT_ID> : <namespace> : <locale>`

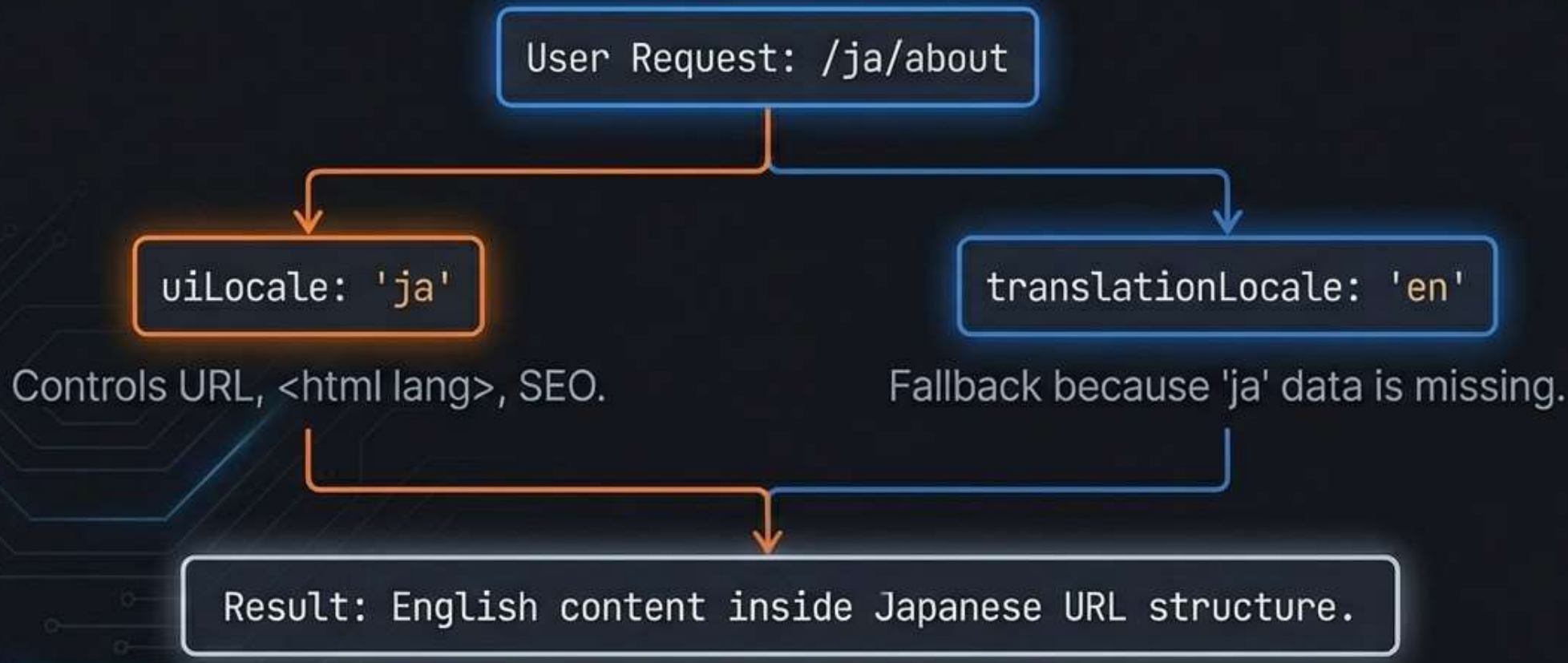
`edgekits : landing : en`

`edgekits : blog : ja`

- **Namespace Splitting:** Separate `landing.json` from `blog.json`.
- **On-Demand Loading:** Fetch only what the page needs.
- **Binding:** Wired as `TRANSLATIONS` in `wrangler.jsonc`.

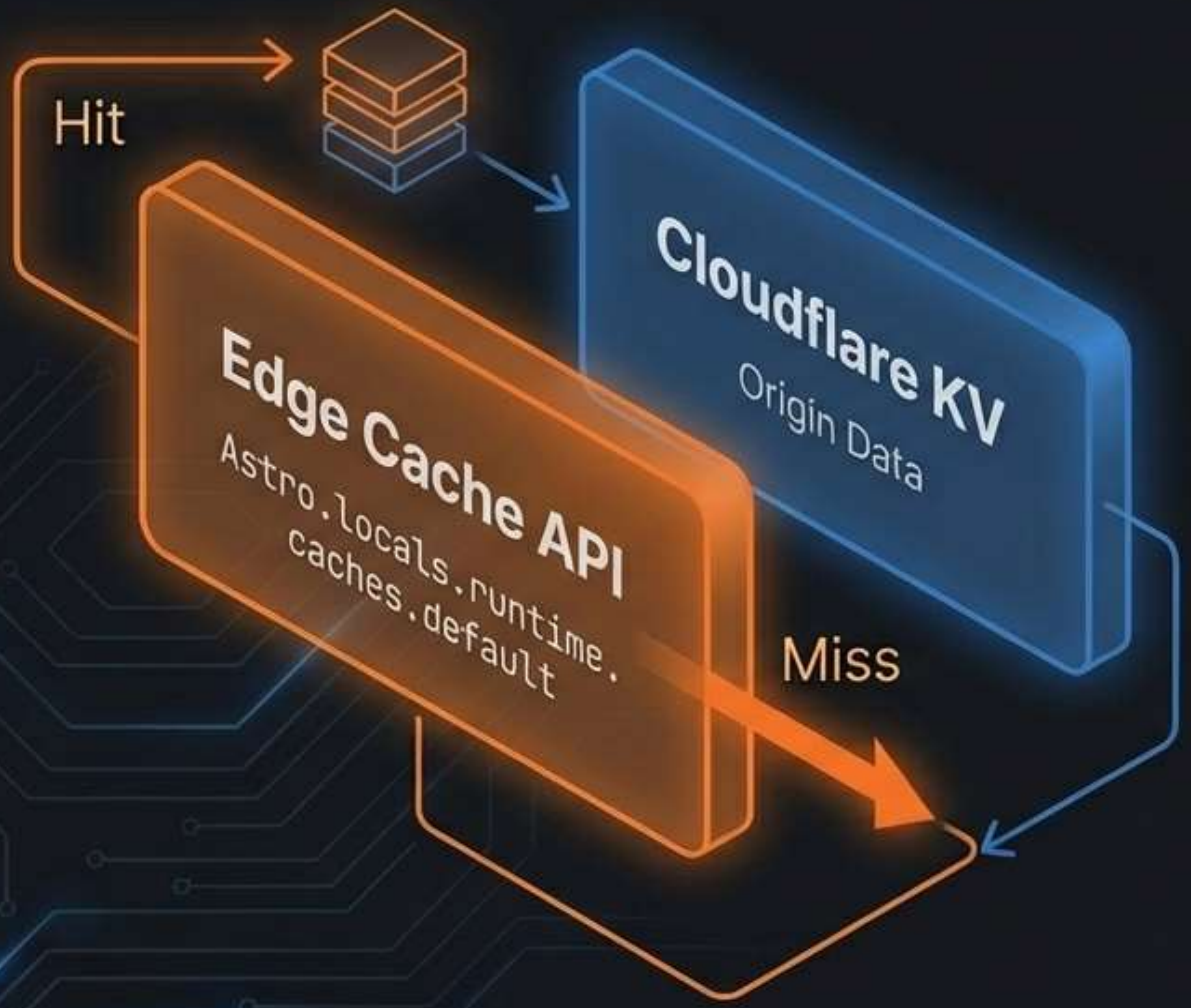
Intelligent Routing: uiLocale vs. translationLocale

Separating User Intent from Data Availability



Prevents runtime crashes. Never undefined.

Performance: The Edge Cache API



Key = Project + Version + Locale + Namespaces

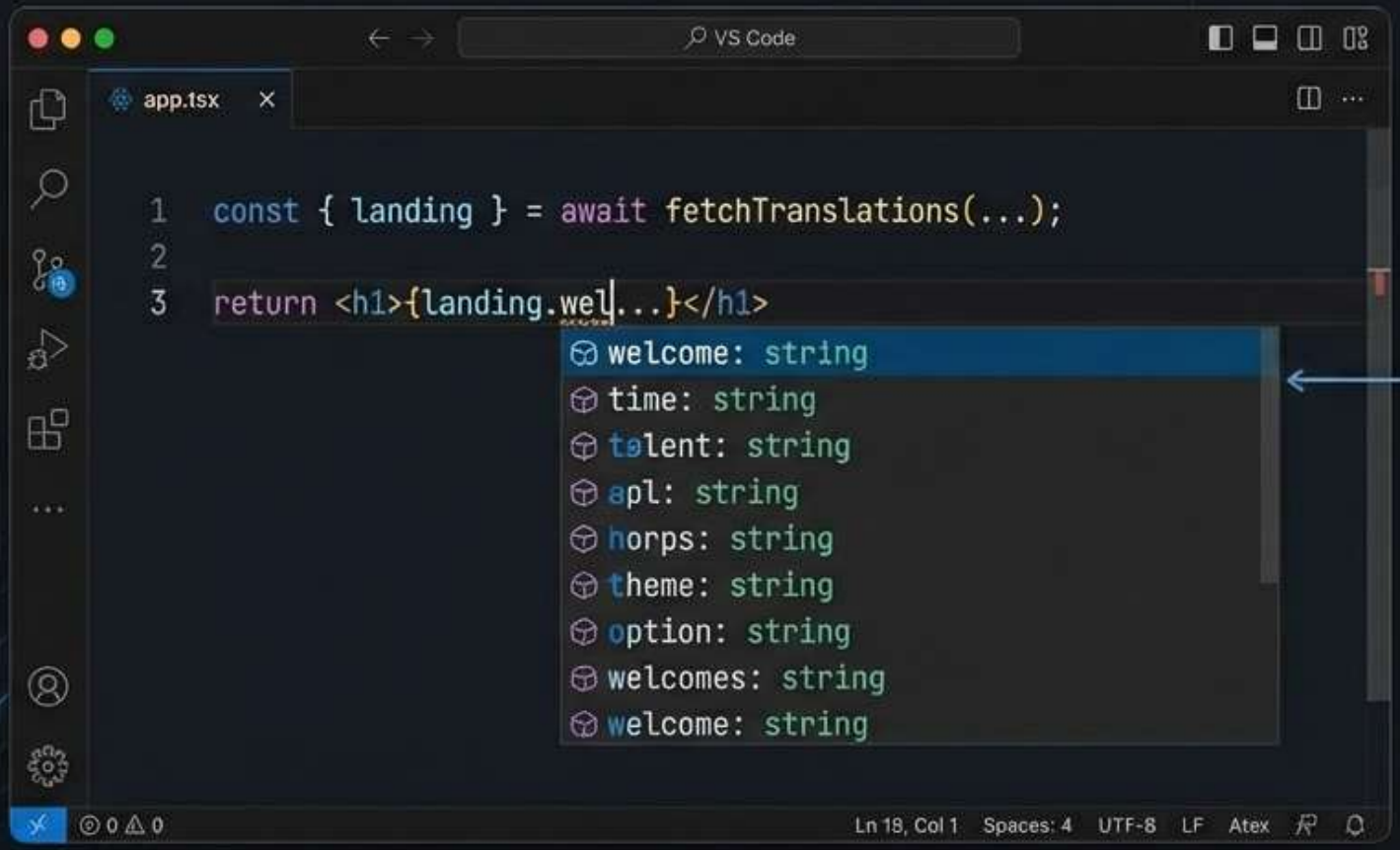
Headers: `Cache-Control: public, s-maxage=3600`

Result: Millisecond latency. Zero KV read costs on hits.

Resilience: Fallback Dictionaries & Safety

The application never breaks. Even in catastrophic failure, the UI renders.

Type Safety: The Developer Experience



Auto-generated TypeScript definitions.

Missing keys caught at Build Time, not Runtime.

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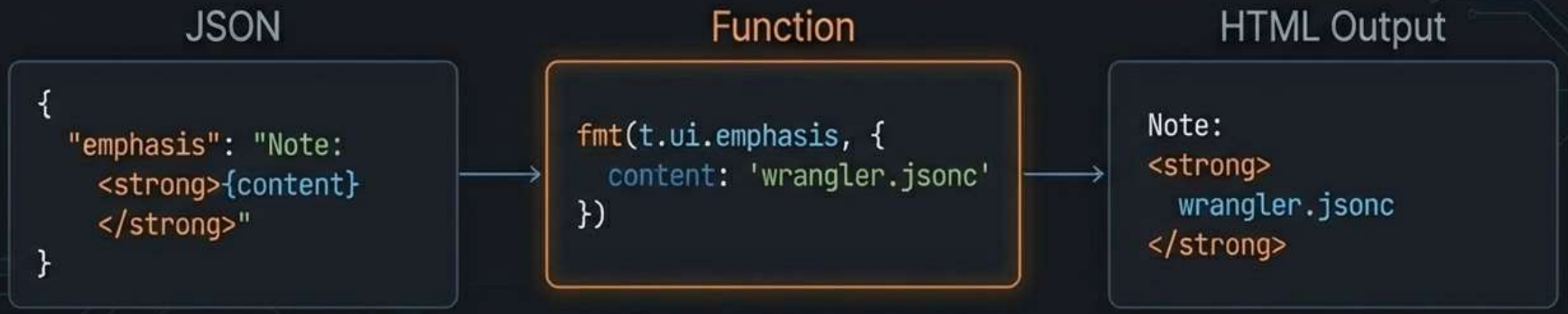
Interpolation & Formatting



Security

XSS Protection. Injected values are automatically escaped.

Plurals

ICU Support. `pluralIcu()` handles zero/one/other rules.

SEO Strategy: URL Structure & Canonical Slugs

✅ `edgekits.dev/ja/architecture`

❌ `edgekits.dev/ja/%E3%82%A2%E3%83%BC...`

- **Shareability:** No ugly percent-encoding in links.
- **Git Stability:** Avoids cross-platform filesystem normalization issues.
- **Architecture:** Predictable Content Collection lookups by canonical ID.

English slugs recommended for maintainability.

The Workflow: Bundle, Seed, Deploy

The Edge-Native Advantage

✔	Zero Client JS	Fastest possible TTI.
✔	Type-Safe	End-to-end validation from JSON to UI.
✔	Resilient	Guaranteed rendering via compiled fallbacks.
✔	Performance	Multi-tiered caching (Edge Cache + CDN).
✔	Scalable	Built on KV for high-throughput global traffic.

Ready to Ship Zero-JS i18n? 🚀

EdgeKits / astro-edgekits-core

The open-source starter for zero-JS edge translations.

★ Star the repo on GitHub

📖 The Full Deep Dive

Read the complete architecture breakdown on the EdgeKits.dev blog.

✉️ Join Early Birds

Get exclusive advanced Astro patterns & launch discounts.

𝕏 @GaryEdgeKits

Let's talk Edge stuff!