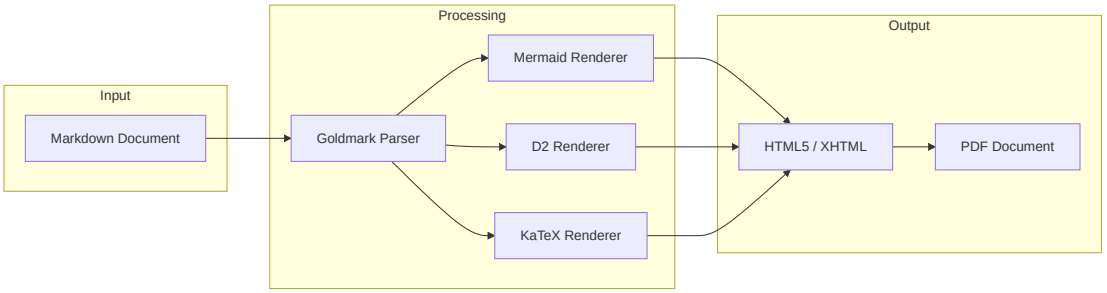
# mdflux Capabilities Demo

This document demonstrates the core rendering capabilities of mdflux. All diagrams and mathematical expressions are rendered server-side to embedded SVG, ensuring consistent display across all environments without requiring client-side JavaScript.

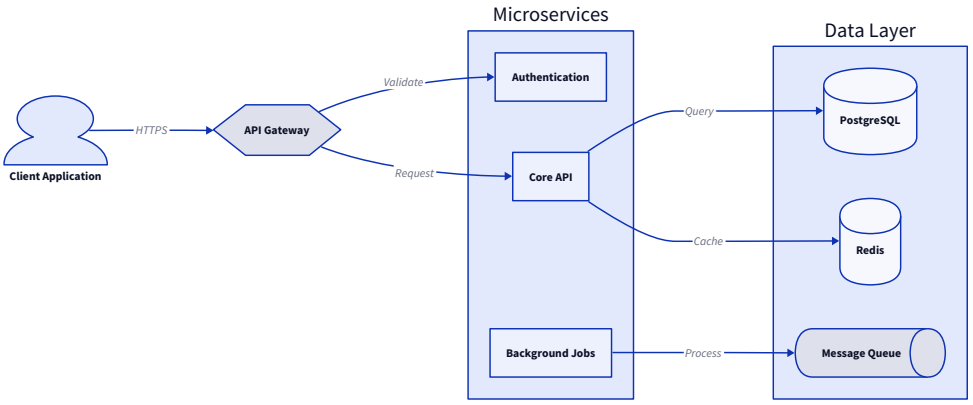
## Diagrams with Mermaid

Mermaid diagrams are rendered server-side using a headless browser, producing clean SVG output that displays identically in HTML and PDF.




## Architecture Diagrams with D2

D2 provides a declarative syntax for creating architecture and infrastructure diagrams, rendered directly to SVG with support for multiple layout engines.




## Mathematical Expressions with KaTeX

Mathematical notation is rendered using KaTeX, producing publication-quality typography for both inline and display equations.

The Fourier Transform of a function $f(t)$ is defined as:

$$\hat{f}(\omega) = \int_{-\infty}^{\infty} f(t)\, e^{-i\omega t}\, dt$$

This integral transforms a time-domain signal into its frequency-domain representation, where $\omega$ represents angular frequency and $i$ is the imaginary unit satisfying $i^2 = -1$.

## Key Advantages

- **No JavaScript Required:** All rendering occurs at build time, producing static SVG content
- **Consistent Output:** Documents render identically in HTML browsers and PDF viewers
- **Single Binary:** No Node.js or complex dependency chains required
- **Print Ready:** PDF output maintains full vector quality for diagrams and equations