



**DOCUMENT  
ENGINEERING**

# CMPSC 104 – Document Engineering

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# Overview

## **What is JAMstack?**

- JAMstack stands for JavaScript, APIs, and Markup.
- It's a modern web architecture focused on decoupling the frontend from backend services.
- The concept promotes building websites and apps using pre-rendered assets served from a Content Delivery Network (CDN), interacting with APIs for dynamic features.

# Key Components of JAMstack

- JavaScript: Handles the dynamic aspects of the site (e.g., validation, interactions).
- APIs: Interact with server-side data and services without needing a full backend.
- Markup: Static HTML that can be pre-built, improving load speed and reducing server load.

# Why JAMstack

- **Pre-rendering:**

- JAMstack sites are pre-rendered, meaning they are generated in advance rather than on-demand, which leads to faster load times and reduced server complexity.
- This approach improves Time to First Byte (TTFB), and allows deployment on a Content Delivery Network (CDN), optimizing global performance by delivering content from the nearest server.

- **Decoupling:**

- JAMstack separates frontend and backend, making it easy to maintain and update each independently.
- Developers can integrate trusted tools and services (e.g., headless CMS, search providers, media storage) without being tied to a single backend, allowing for flexible and scalable applications.

# JAMstack Tools & Services

Jamstack.org [lists over 300 static site generators!](#)

- **Building a JAMstack Site:**
  - Choose a framework (e.g., static site generator),
  - Select a content management system,
  - Decide on a deployment service.

# CMS

- CMS stands for Content Management System. It provides a user-friendly interface to manage website content without directly editing code.
- Common tasks include creating and updating blog posts, managing media, and organizing pages or sections.

# Types of CMS in JAMstack

- Traditional CMS: Combines backend and frontend (e.g., WordPress).
- Headless CMS: Separates the backend (content management) from the frontend, ideal for JAMstack sites. Examples include Contentful, Sanity, and Netlify CMS.

# Static Site Generators

- **Definition:** Unlike traditional CMSes, static site generators create pre-rendered HTML pages, reducing the need for client-side JavaScript.
- **Examples:** Gatsby, Jekyll, Next.js, and Hugo.
- **Benefit:** Pages are bundled with data at build time and served from a CDN for fast, scalable performance.



# APIs

APIs standards for Application Programming Interfaces, are mechanisms that enable two software components to communicate with each other using a set of definitions and protocols.

For example, the weather bureau's software system contains daily weather data. The weather app on your phone "talks" to this system via APIs and shows you daily weather updates on your phone.

## **APIs Are Important in JAMstack**

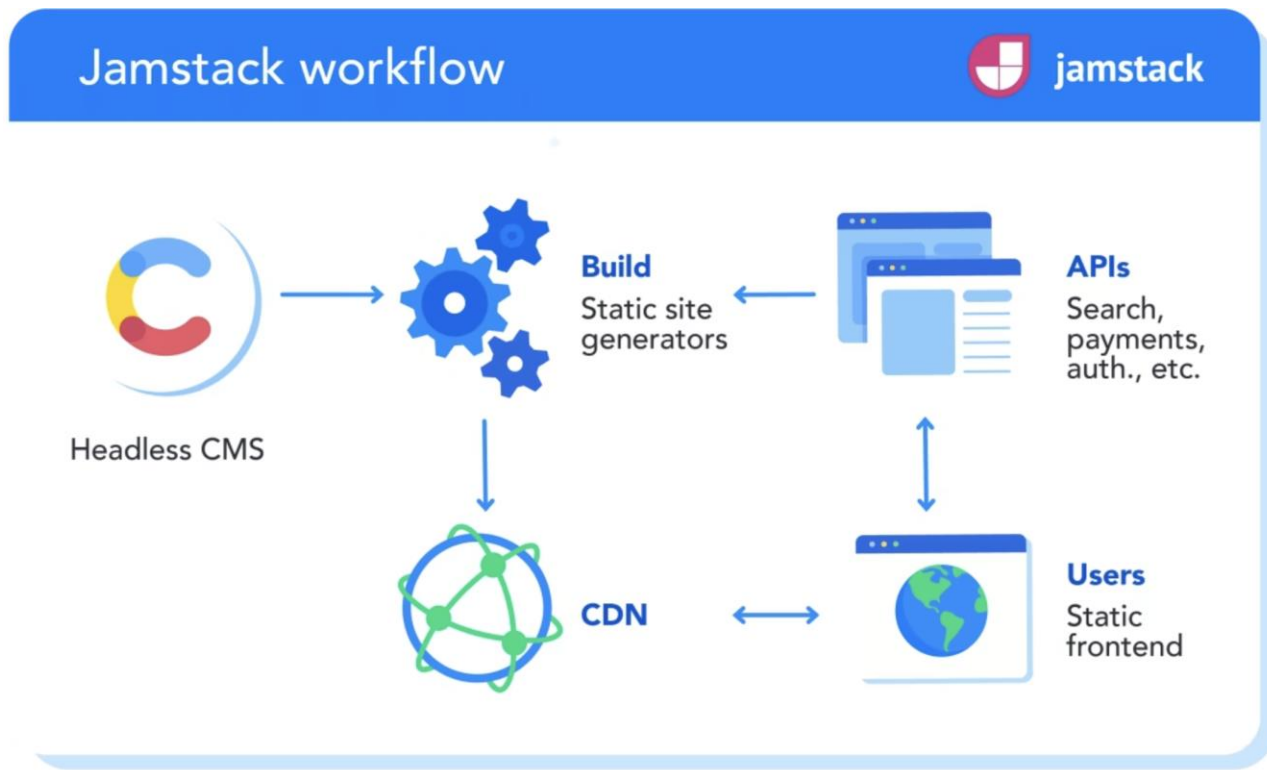
- They allow static site generators (SSGs) to integrate with external services for features like search, payment processing, and data retrieval from external sources
- For example: search, authentication, media management, and more.
- Popular API Integrations: Shopify (ecommerce), Auth0 (authentication).

# Deployment

- **Deploy in Minutes:**

- Services like **Netlify**, **Vercel**, and **GitHub** connect to Git and streamline the deployment process.

# JAMstack Workflow



# Popular Examples of JAMstack Projects

- GatsbyJS: A React-based framework optimized for static sites, often used for blogs and e-commerce.
- Netlify: A hosting platform specifically designed for JAMstack, with built-in CI/CD and serverless functions.
- Netlify CMS: A headless CMS that provides a backend-as-a-service for content management in JAMstack sites.

# How to Get Started with JAMstack

- Choose a Static Site Generator: Popular choices are Gatsby, Next.js, Hugo, or Jekyll.
- Pick a Headless CMS: Options like Contentful, Sanity, Netlify CMS and Strapi work well with JAMstack.
- Deploy and Host: Platforms like Netlify and Vercel provide easy hosting and deployment for JAMstack projects.

# Gatsby - Installation

<https://nodejs.org/en/download/package-manager>

```
node -version
```

```
npm - version
```

```
npm install --global gatsby-cli
```

```
gatsby --version
```

# Gatsby – Creating a New Site

```
cd path\to\gatsby
```

```
gatsby new ga_site https://github.com/gatsbyjs/gatsby-starter-hello-world
```

```
cd ga_site
```

```
gatsby develop
```

# Reference and Resources

- Contentful's JAMstack CMS (<https://www.contentful.com/help/jamstack-cms/>)
- [What is an API? - Application Programming Interface Explained - AWS \(amazon.com\)](#)