Product Research & Competitive Analysis

Technical Case Study: Mentimeter Live Polling System

A comprehensive examination of Mentimeter's technology stack, architecture, and real-time communication infrastructure

Authored By:

Kirubel Mamo

(a.k.a. 0utis)

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1 Executive Summary

This technical case study presents a comprehensive competitive analysis of Mentimeter, a leading live polling and interactive presentation platform. Through systematic reconnaissance, traffic analysis, and infrastructure examination, this research reveals the underlying technologies, architectural patterns, and third-party integrations that power Mentimeter's real-time collaboration capabilities.

The investigation employed multiple methodologies including technology fingerprinting, DNS enumeration, passive API traffic observation, network inspection via BurpSuite and browser developer tools, and documentation review. All reconnaissance activities were strictly passive in nature, with no exploit attempts, illegal payloads, or evasive testing conducted. Key findings include the identification of Mentimeter's technology stack (Next.js 14.2.35 frontend, with Ruby on Rails backend and PostgreSQL database inferred through logical deduction from OSINT sources including founder portfolios and public API response patterns), their real-time communication infrastructure powered by Ably, and their cloud infrastructure hosted on AWS with Cloudflare as a CDN and reverse proxy.

This analysis provides actionable insights for building a competitive live polling system, highlighting critical technology choices, architectural patterns, and integration strategies that enable Mentimeter's seamless user experience.

2 Methodology

2.1 Research Approach

The research methodology consisted of five primary phases, each designed to uncover different aspects of Mentimeter's technical implementation:

Phase 1: User Experience Analysis – Initial exploration of the platform from an end-user perspective to understand core workflows, user journeys, and interaction patterns.

Phase 2: Technology Fingerprinting – Systematic identification of frontend frameworks, backend technologies, and infrastructure components using automated tools and manual inspection.

Phase 3: Infrastructure Reconnaissance – DNS enumeration, subdomain discovery, TXT record analysis, and ASN identification to map external services and third-party integrations.

Phase 4: Network Traffic Analysis – Deep packet inspection using BurpSuite and browser developer tools to analyze API communication patterns, authentication flows, and real-time messaging protocols.

Phase 5: Documentation and OSINT – Review of founder profiles, company blog posts, official documentation, and technical resources to validate findings and uncover additional implementation details.

2.2 Tools and Resources

The following tools and resources were utilized throughout the investigation:

- **Wappalyzer**: Frontend technology detection
- **WhatWeb**: Secondary web technology detection and fingerprint verification

- **cURL**: HTTP header analysis for framework identification (Next.js detection via X-Powered-By headers)
- **HTTPX**: High-performance HTTP probing and CDN detection
- **BGP.he.net**: Autonomous System Number (ASN) lookup
- **NSLookup**: DNS record queries and IP resolution
- **CDN Planet**: Content Delivery Network identification
- **BurpSuite**: HTTP/HTTPS traffic interception and passive analysis
- **Browser Developer Tools**: Network traffic inspection, JavaScript debugging
- **Custom Subdomain Enumeration Script**: My own tooling for passive subdomain discovery
- **Flowsint**: Subdomain enumeration and digital footprint analysis
- **LinkedIn**: Founder and team technology profiling (OSINT)
- **StackShare.io**: Technology stack verification
- **Obsidian**: Flow diagram creation and visualization

3 Technology Stack Identification

3.1 Frontend Technologies

Mentimeter's client-side application is built on modern JavaScript frameworks optimized for performance and SEO.

3.1.1 Next.js Framework

Technology fingerprinting via Wappalyzer revealed that Mentimeter utilizes **Next.js version 14.2.35** as their primary frontend framework. Next.js, a React-based framework developed by Vercel, provides server-side rendering (SSR), static site generation (SSG), and hybrid rendering capabilities – features that are particularly valuable for a presentation platform requiring fast initial page loads and SEO optimization.

The choice of Next.js suggests several architectural priorities:

- Server-side rendering for improved performance on initial load
- Built-in routing and code splitting for optimal bundle sizes
- API routes capability for backend-for-frontend (BFF) patterns
- Strong TypeScript support for type-safe development

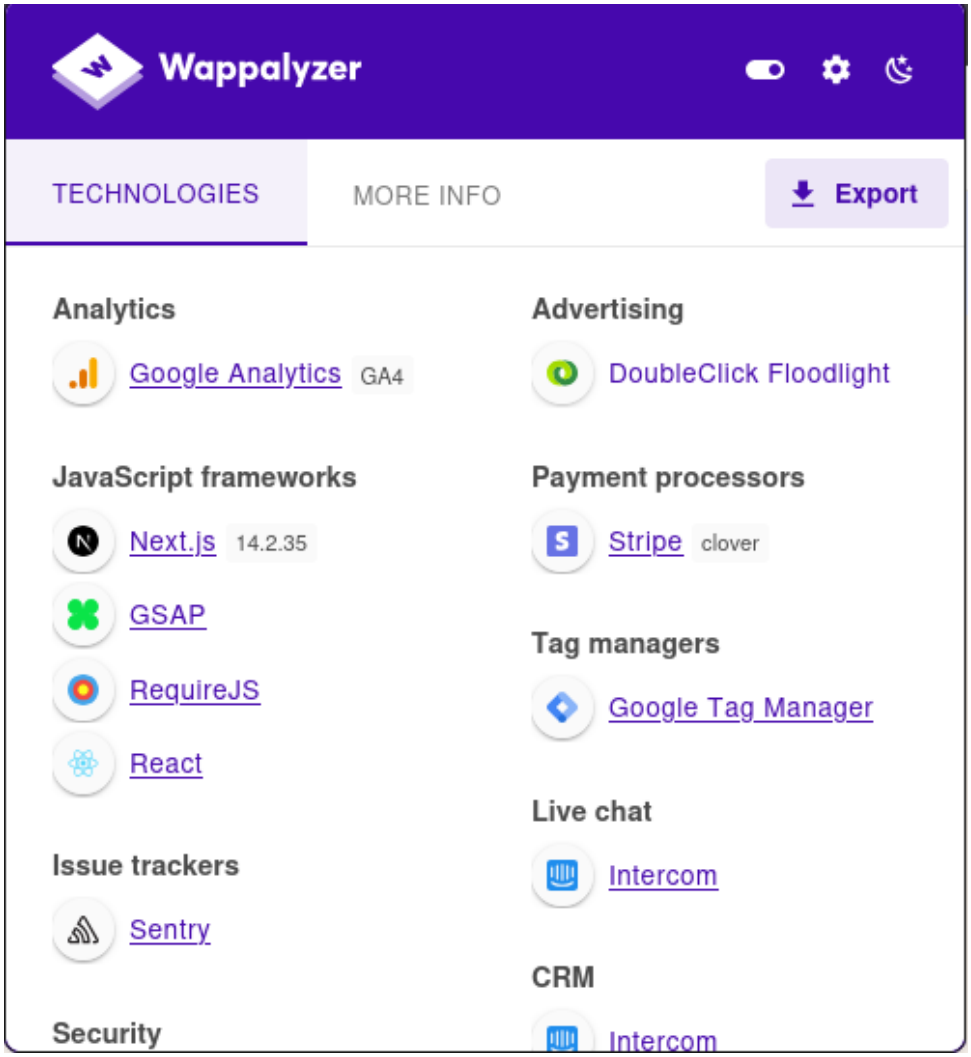

Figure 1: Technology fingerprinting results showing Next.js 14.2.35

3.1.2 Custom Component Library: Ragnar UI

Network traffic analysis and JavaScript debugging revealed the use of **@menti/ragnar-ui**, a proprietary component library developed in-house by Mentimeter's engineering team. This custom UI library is specifically designed for generating and rendering interactive presentations, encapsulating the core polling interface components, real-time visualization widgets, and dynamic slide elements that power Mentimeter's interactive presentation experience. Beyond standard design system components, Ragnar UI includes specialized modules for poll type rendering (multiple choice, word clouds, Q&A interfaces), live result animations, and participant interaction patterns specific to Mentimeter's brand and UX requirements.

The development of a custom component library indicates:

- Mature engineering practices with emphasis on code reusability
- Strong design system governance
- Investment in long-term maintainability and consistency
- Potential for white-label or multi-brand deployments

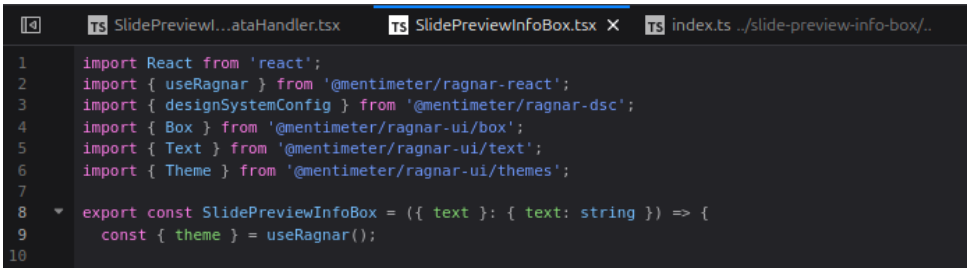

Figure 2: Browser debugger showing Ragnar UI library in action

3.2 Backend Technologies

3.2.1 Ruby on Rails

Analysis of co-founder portfolios and LinkedIn profiles revealed references to **Ruby on Rails** as the backend framework. Specifically, **Andrei Subbota**, who served as Senior Backend Engineer at Mentimeter, explicitly mentions on his personal portfolio (https://www.numbata.com/) his work with an in-house framework based on **Grape**, a REST-like API micro-framework for Ruby. This finding aligns with the broader Ruby ecosystem commonly used for rapid application development and API-first architectures in the SaaS space, with Grape providing a lightweight alternative to full Rails for building RESTful services.

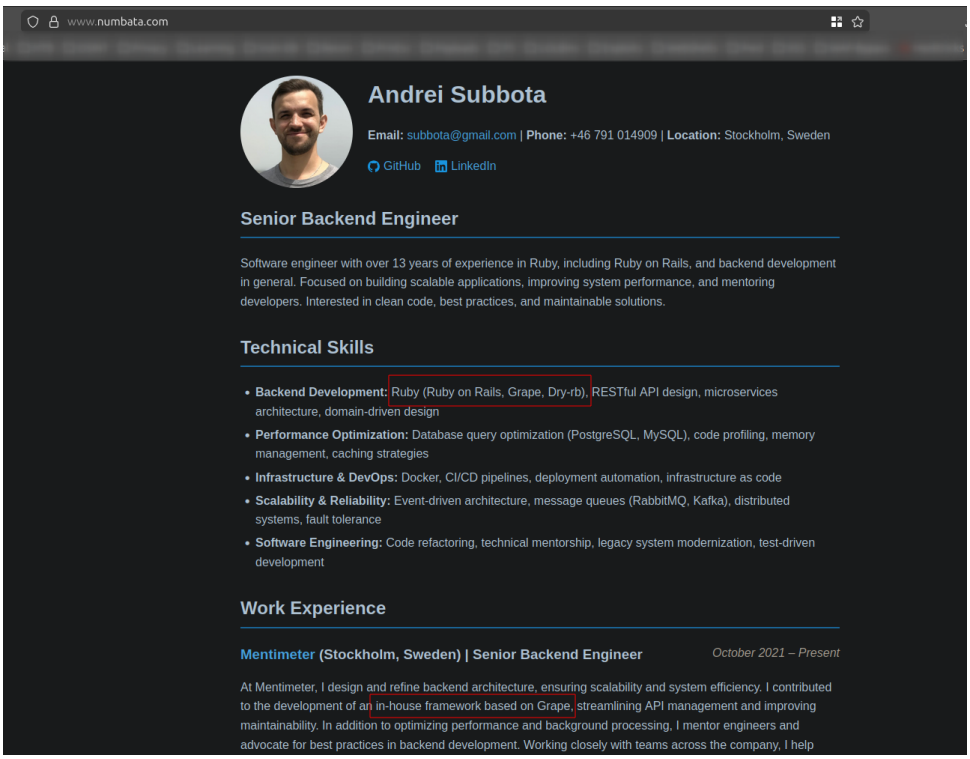

Figure 3: Co-founder, Andrei, portfolio mentioning Grape, a Ruby micro-framework.

Rails provides several advantages for a live polling platform:

- Convention-over-configuration philosophy for rapid development
- ActiveRecord ORM for database abstraction
- Strong ecosystem for RESTful API development

3.2.2 PostgreSQL Database

LinkedIn profile analysis of Mentimeter's technical co-founder, **Augusto Cesar**, revealed PostgreSQL and Ruby proficiency listed among his skills obtained during his tenure as Software Engineer at Mentimeter (https://www.linkedin.com/in/augustoccesar/). This dual mention of PostgreSQL and Ruby strongly suggests PostgreSQL as the primary relational database management system (RDBMS) working in conjunction with the Ruby-based backend infrastructure, further corroborating the Ruby on Rails/Grape technology stack inference.

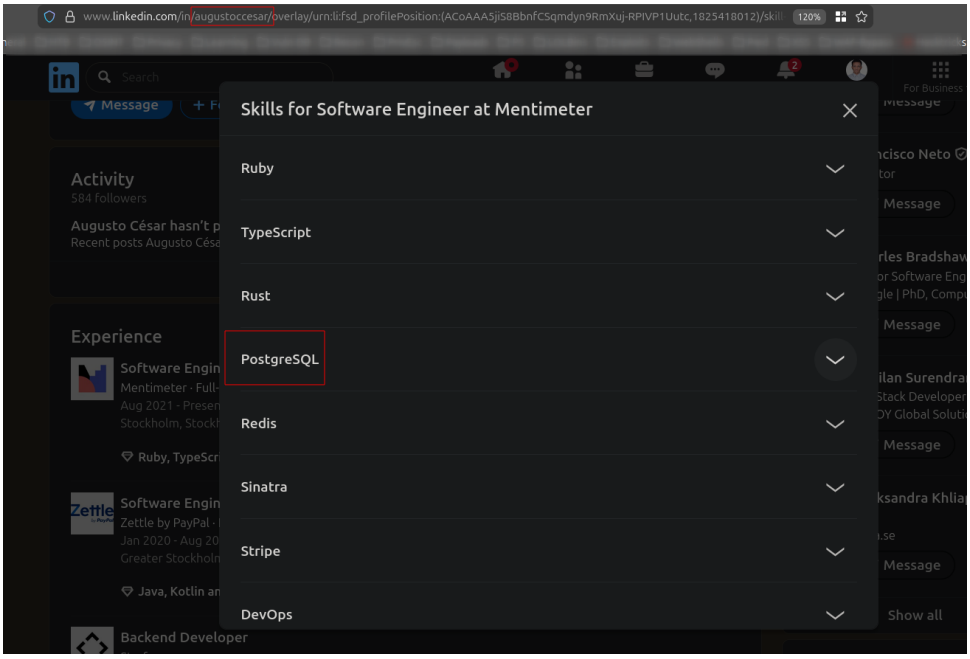

Figure 4: Co-founder, Augusto, LinkedIn profile indicating PostgreSQL expertise

PostgreSQL is a logical choice for this use case due to:

- ACID compliance for transactional consistency
- JSONB support for flexible schema design (ideal for poll configurations)
- Strong indexing capabilities for rapid query performance
- Excellent Ruby on Rails integration via ActiveRecord

3.3 Infrastructure and Networking

3.3.1 Cloudflare CDN and Reverse Proxy

DNS resolution via NSLookup and CDN detection via CDN Planet confirmed that Mentimeter leverages **Cloudflare** as both a Content Delivery Network (CDN) and reverse proxy. The service resolves to Cloudflare IP addresses `172.64.146.149` and `104.18.41.107`.

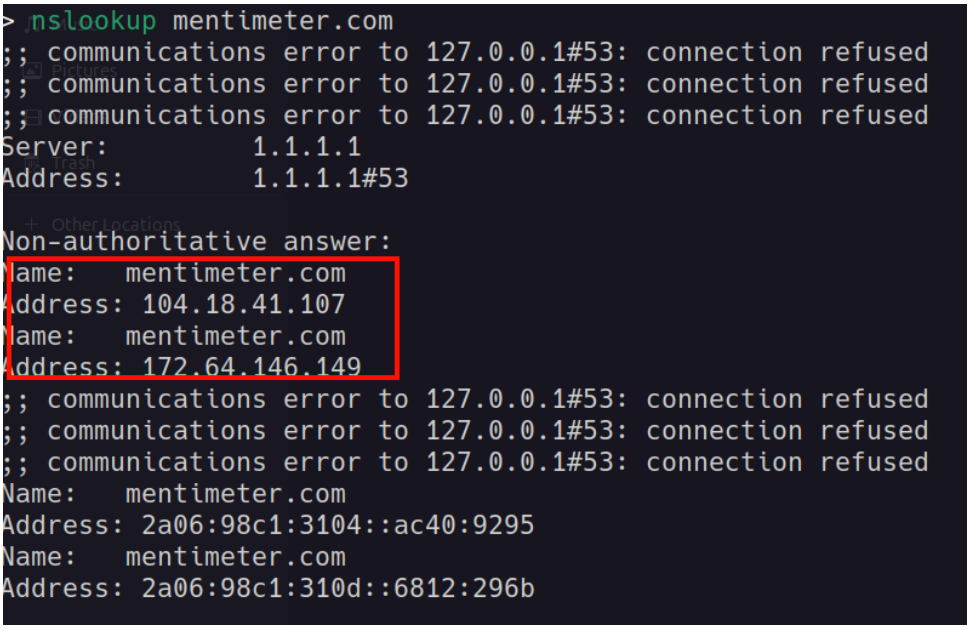

Figure 5: Cloudflare IP addresses from NSLookup

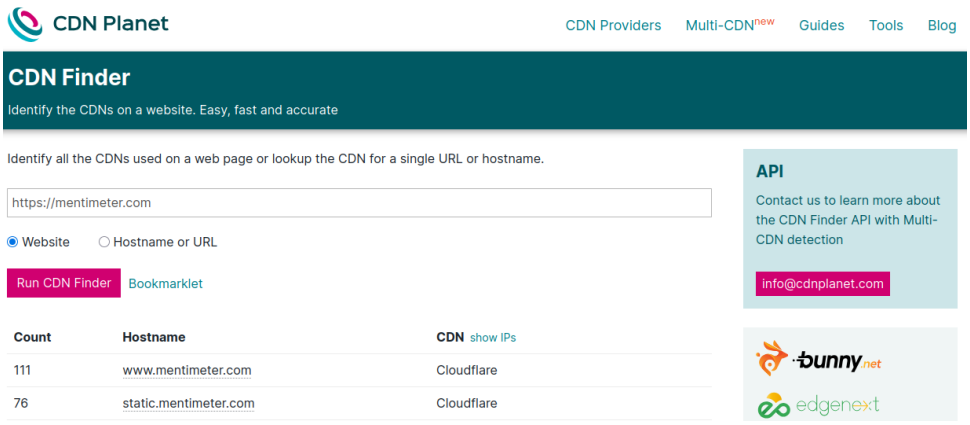

Figure 6: Cloudflare CDN configuration

Cloudflare provides several critical services:

- Global CDN for static asset distribution
- DDoS protection and Web Application Firewall (WAF)
- Bot detection and rate limiting
- SSL/TLS termination
- DNS management

3.3.2 Autonomous System Number

BGP analysis via https://bgp.he.net revealed Mentimeter's ASN as **AS13335**, which corresponds to Cloudflare's network. This confirms that all public-facing traffic is routed through Cloudflare's edge network before reaching origin servers.

104.18.41.107 > 104.18.41.0/24 > AS13335 > Cloudflare, Inc.
104.18.41.107 > 104.18.32.0/20 > AS13335 > Cloudflare, Inc.
104.18.41.107 > 104.18.32.0/19 > AS13335 > Cloudflare, Inc.
104.18.41.107 > 104.16.0.0/12 > AS13335 > Cloudflare, Inc.
172.64.146.149 > 172.64.146.0/24 > AS13335 > Cloudflare, Inc.
2a06:98c1:3104::ac40:9295 > 2a06:98c1:3104::/48 > AS13335 > Cloudflare, Inc.
2a06:98c1:310d::6812:296b > 2a06:98c1:310d::/48 > AS13335 > Cloudflare, Inc.

Figure 7: ASN lookup showing AS13335 (Cloudflare)

3.3.3 Amazon Web Services (AWS) Cloud Infrastructure

Analysis of Mentimeter's data privacy documentation and TXT records indicates that infrastructure is hosted on **Amazon Web Services (AWS)**. The data at rest location documentation specifically mentions AWS Ireland (eu-west-1) as the primary region.

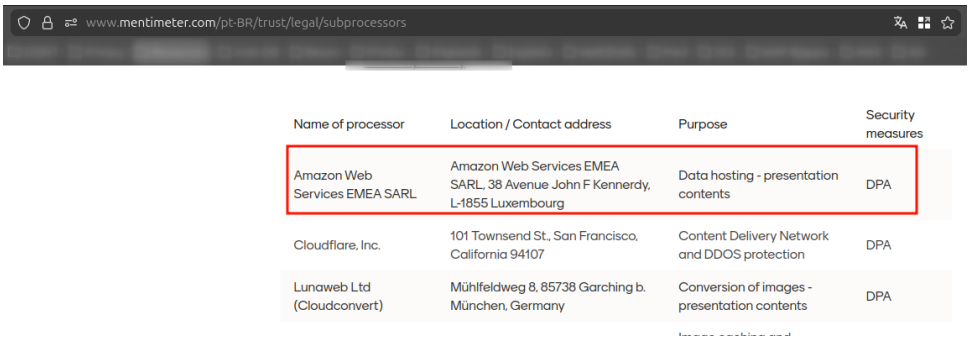

Figure 8: AWS cloud provider evidence

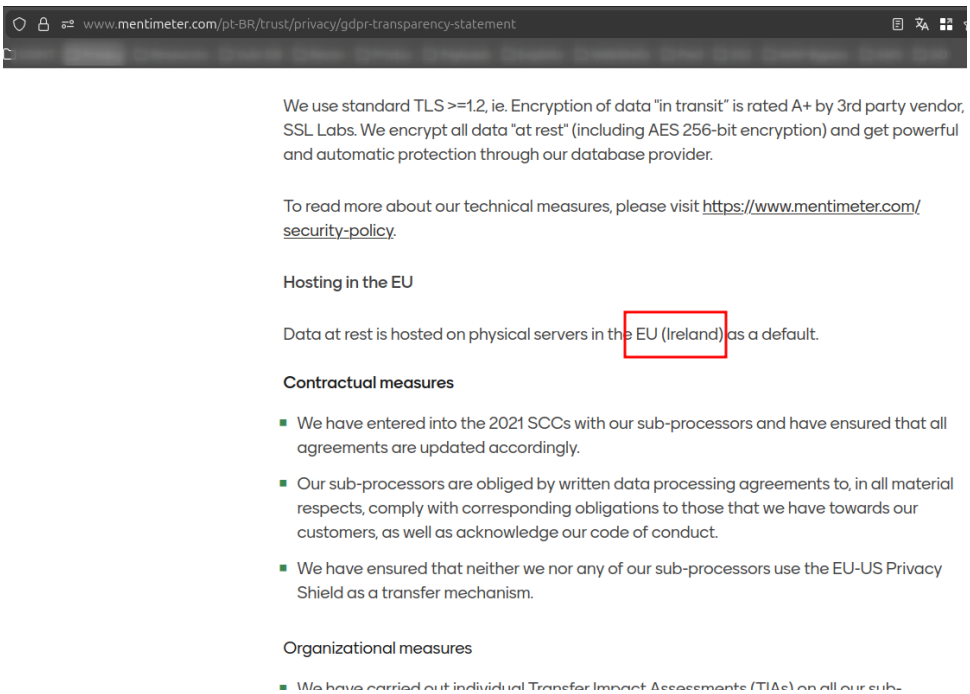

Figure 9: Data residency documentation showing AWS Ireland

This AWS deployment likely includes:

- EC2 instances for application servers
- RDS for managed PostgreSQL databases
- S3 for object storage (presentations, media assets)
- ElastiCache for session management and caching
- Route53 for DNS management (in conjunction with Cloudflare)

4 Third-Party Integrations and Services

4.1 Discovery Methodology: DNS TXT Record Analysis

A comprehensive examination of Mentimeter's DNS TXT records revealed an extensive ecosystem of third-party services and integrations. TXT records are commonly used for domain verification by SaaS providers, making them an invaluable OSINT resource for identifying a company's technology partnerships.

The following TXT record verification strings were discovered:

```
> host -t TXT mentimeter.com
;; communications error to 127.0.0.1#53: connection refused
;; communications error to 127.0.0.1#53: connection refused
;; Connection to 127.0.0.1#53(127.0.0.1) for mentimeter.com failed: connection refused.
mentimeter.com descriptive text "19C48D90DD"
mentimeter.com descriptive text "GAD2ZC5LWSB345TVM11C21H7QPETCIHHKHRFGMHA"
mentimeter.com descriptive text "UK-federation-domain-verification=424fbea2004943234196f456bb73c782"
mentimeter.com descriptive text "ZOOM_verify_No381zz8RaOL9HmKkOsAGQ"
mentimeter.com descriptive text "_globalsign-domain-verification=0JEhOe62Cfbif4azrMpzr_iAjSrnAtapTI28bIYXcP"
mentimeter.com descriptive text "apple-domain-verification=gjIrphBjRw1fD2LH"
mentimeter.com descriptive text "cursor-domain-verification-36b4t1=rSKB6dRpg2zobQQU1fwOC26Lz"
mentimeter.com descriptive text "detectify-verification=7bcc8e92dd6868607d3bdb0d23669447"
mentimeter.com descriptive text "facebook-domain-verification=g53js9j21nz82nfavttzvlst5xav1n"
mentimeter.com descriptive text "float-verification-code-4d50251f-2b56-48d0-9091-cf9fb0a867ce"
mentimeter.com descriptive text "google-site-verification=1pP1V27_MkQ8ccB6ubHZpi4gAPZqyjfpFHjbAYpRuWM"
mentimeter.com descriptive text "google-site-verification=AUYQMx_hmNeiShf2YhTJ2RgvMZ3_omDZLUPbyRfBEq4"
mentimeter.com descriptive text "google-site-verification=epbJI9rM2kZP6_i_ls5-AGBWQG03LCgMI1raehg1tVk"
mentimeter.com descriptive text "h1-domain-verification=h891vnyD4z9rbdjGPiLSzWDgc5qg8Q3jAEgJfjTYSG6qbxjU"
mentimeter.com descriptive text "mentimeter-a644d554-434f-4ee1-ab43-318cba0bf167"
mentimeter.com descriptive text "mixpanel-domain-verify=cfbf7776-3961-462e-94ff-01fd0e7e89d5"
mentimeter.com descriptive text "notion-domain-verification=EYVMIE1zmO3bEgA16ufvWlb9SugZIP1NCw9ds3KGRlu"
mentimeter.com descriptive text "openai-domain-verification=dv-VgjPYv00WTIOGQigVOfE6qMT"
mentimeter.com descriptive text "plooto-verification=7e6eb5b2e4e648de874bfce38ee8f7d0891764c6fa7647e087ed3f3b940eda78"
mentimeter.com descriptive text "stripe-verification=2b0cf1098f08d73f62e4a7c638688432ebddda72dbcb4a82abab9a0f60b1de06"
mentimeter.com descriptive text "stripe-verification=7413adbd48e28af3faa020f096de5518a7e9ba0018c5bfd184db44b978794899"
mentimeter.com descriptive text "v=spf1 include:_spf.google.com include:_spf.salesforce.com ~all"
mentimeter.com descriptive text "zoom-domain-verification="
```

Figure 10: TXT record for mentimeter.com domain

4.2 Real-Time Communication: Ably

One of the most critical findings is Mentimeter's use of **Ably** for real-time bidirectional communication between presenters and participants. This was confirmed through three independent sources:

1. Mentimeter lists Ably as a subprocessor at https://www.mentimeter.com/pt-BR/trust/legal/subprocessors.
2. Network traffic analysis showing WebSocket connections to Ably endpoints.
3. Ably's case studies list Mentimeter as a customer at https://ably.com/case-studies/mentimeter.
4. Clear evidence of Ably usage in Mentimeter's frontend code, identified via browser developer tools.

Figure 11: Ably documentation code snippet

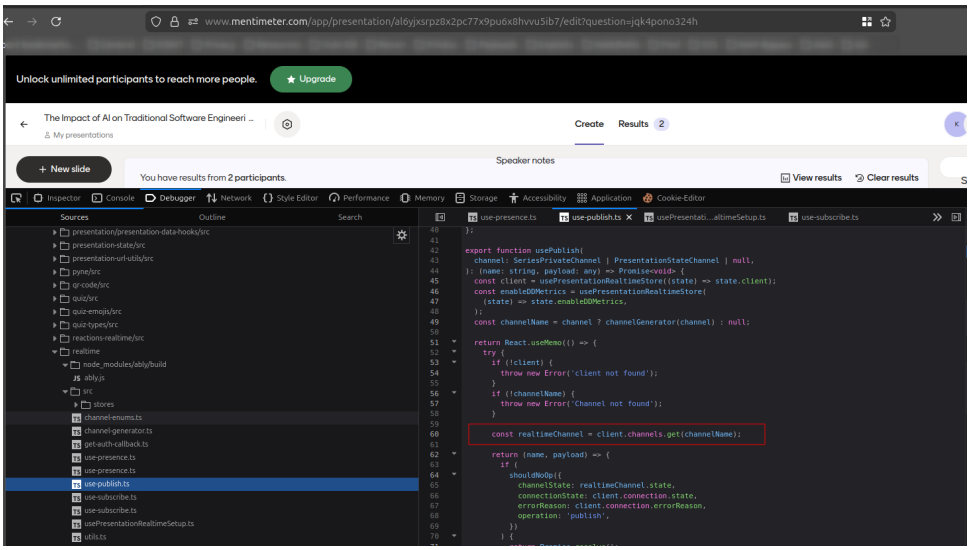

Figure 12: Ably implementation detected in browser debugger

Ably provides enterprise-grade messaging with the following features, as documented in its official documentation https://ably.com/docs:

- WebSocket and HTTP streaming protocols
- Global edge network for low-latency message delivery
- Guaranteed message ordering and delivery
- Presence detection for participant tracking
- Historical message replay capabilities
- Automatic reconnection and connection state recovery

For Mentimeter's use case, Ably handles:

- Live poll responses from participants to presenter
- Real-time vote count updates and visualizations
- Participant join/leave notifications
- Slide transitions and presentation control signals
- Q&A message broadcasting

4.3 Payment Processing: Stripe

Stripe serves as Mentimeter's payment gateway and subscription billing platform, as evidenced by stripe-verification TXT records and cookies.

```
> host -t TXT mentimeter.com
;; communications error to 127.0.0.1#53: connection refused
;; communications error to 127.0.0.1#53: connection refused
;; Connection to 127.0.0.1#53(127.0.0.1) for mentimeter.com failed: connection refused.
mentimeter.com descriptive text "19C48D90DD"
mentimeter.com descriptive text "GAD2ZC5LWSB345TVM11C21H7QPETCIHHKHRFGMHA"
mentimeter.com descriptive text "UK-federation-domain-verification=424fbea2004943234196f456bb73c782"
mentimeter.com descriptive text "ZOOM_verify_No381zz8RaOL9HmKkOsAGQ"
mentimeter.com descriptive text "_globalsign-domain-verification=0JEhOe62Cfbif4azrMpzr_iAjSrnAtapTI28bIYXcP"
mentimeter.com descriptive text "apple-domain-verification=gjIrphBjRw1fD2LH"
mentimeter.com descriptive text "cursor-domain-verification-36b4t1=rSKB6dRpg2zobQQU1fwOC26Lz"
mentimeter.com descriptive text "detectify-verification=7bcc8e92dd6868607d3bdb0d23669447"
mentimeter.com descriptive text "facebook-domain-verification=g53js9j21nz82nfavttzvlst5xav1n"
mentimeter.com descriptive text "float-verification-code-4d50251f-2b56-48d0-9091-cf9fb0a867ce"
mentimeter.com descriptive text "google-site-verification=1pP1V27_MkQ8ccB6ubHZpi4gAPZqyjfpFHjbAYpRuWM"
mentimeter.com descriptive text "google-site-verification=AUYQMx_hmNeiShf2YhTJ2RgvMZ3_omDZLUPbyRfBEq4"
mentimeter.com descriptive text "google-site-verification=epbJI9rM2kZP6_i_ls5-AGBWQG03LCgMI1raehg1tVk"
mentimeter.com descriptive text "h1-domain-verification=h891vnyD4z9rbdjGPiLSzWDgc5qg8Q3jAEgJfjTYSG6qbxjU"
mentimeter.com descriptive text "mentimeter-a644d554-434f-4ee1-ab43-318cba0bf167"
mentimeter.com descriptive text "mixpanel-domain-verify=cfbf7776-3961-462e-94ff-01fd0e7e89d5"
mentimeter.com descriptive text "notion-domain-verification=EYVMIE1zmO3bEgA16ufvWlb9SugZIP1NCw9ds3KGRlu"
mentimeter.com descriptive text "openai-domain-verification=dv-VgjPYv00WTIOGQigVOfE6qMT"
mentimeter.com descriptive text "plooto-verification=7e6eb5b2e4e648de874bfce38ee8f7d0891764c6fa7647e087ed3f3b940eda78"
mentimeter.com descriptive text "stripe-verification=2b0cf1098f08d73f62e4a7c638688432ebddda72dbcb4a82abab9a0f60b1de06"
mentimeter.com descriptive text "stripe-verification=7413adbd48e28af3faa020f096de5518a7e9ba0018c5bfd184db44b978794899"
mentimeter.com descriptive text "v=spf1 include:_spf.google.com include:_spf.salesforce.com ~all"
mentimeter.com descriptive text "zoom-domain-verification="
```

Figure 13: Additional Stripe gateway verification

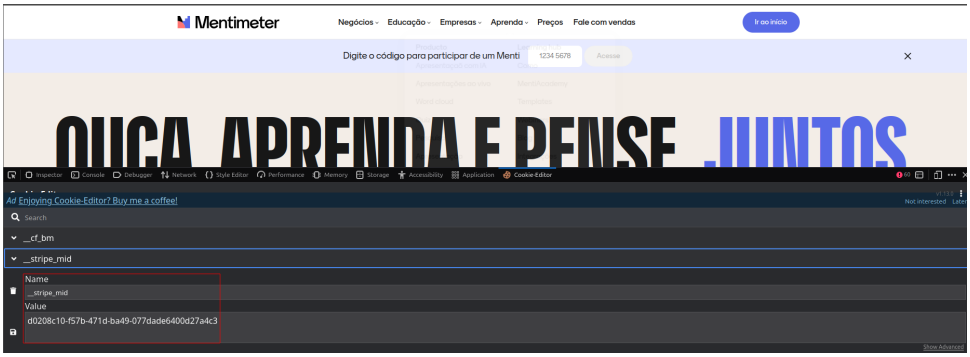

Figure 14: Evidence of Stripe usage based on the presence of the __stripe_mid cookie

Stripe provides:

- Recurring subscription billing for SaaS plans
- PCI-DSS compliant payment processing
- Support for multiple currencies and payment methods
- Webhook notifications for payment events
- Billing portal for customer self-service

4.4 AI Integration: OpenAI

The presence of the **openai-domain-verification** record indicates integration with OpenAI's APIs to support AI-assisted slide creation features within Mentimeter, including:

- Automatic generation of presentation slides based on user-provided topics or prompts
- AI-assisted drafting of slide titles and bullet-point content
- Context-aware suggestions for structuring presentations and refining slide content
- Natural language processing of user input to transform free-text ideas into structured slide layouts

This finding aligns with the broader industry trend of embedding generative AI capabilities into collaboration tools.

4.5 Analytics and Product Intelligence

4.5.1 Mixpanel

Mixpanel serves as Mentimeter's product analytics platform, enabling event tracking, funnel analysis, and user cohort analysis.

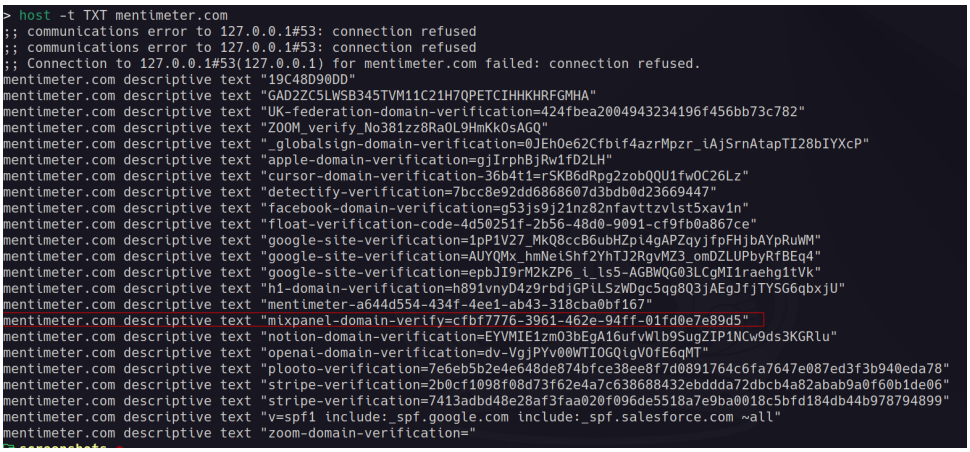

Figure 15: Mixpanel verification in DNS records

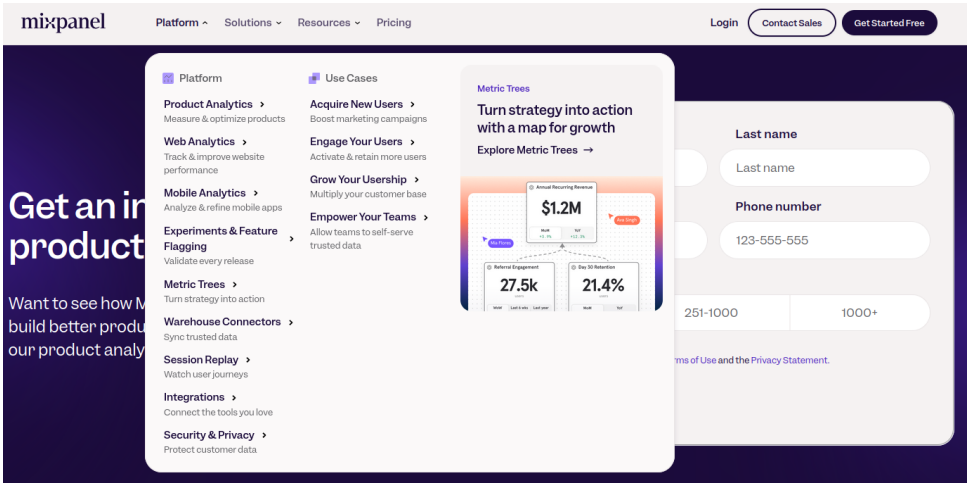

Figure 16: Mixpanel implementation details

Mixpanel provides capabilities for:

- User behavior tracking across presentation lifecycle
- Conversion funnel analysis (free to paid users)
- A/B testing and feature flag management
- Retention analysis and churn prediction
- Custom event tracking for product-specific metrics

4.6 Customer Support: Intercom

Intercom powers Mentimeter's customer support and engagement platform, providing in-app messaging, help center, and customer communication tools.

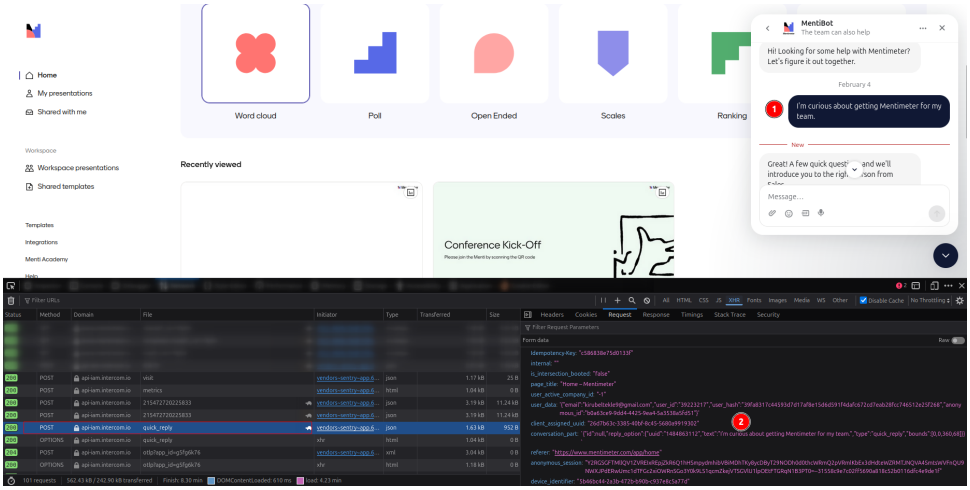

Figure 17: Intercom integration evidence

Intercom enables:

- Live chat support within the application
- Proactive messaging and product tours
- Help center documentation integration
- Customer relationship management (CRM)
- User segmentation for targeted communications

4.7 Security and Compliance

4.7.1 Detectify - Continuous Security Scanning

Detectify provides automated vulnerability assessment and continuous security monitoring for Mentimeter's web assets.

```
> host -t TXT mentimeter.com
;; communications error to 127.0.0.1#53: connection refused
;; communications error to 127.0.0.1#53: connection refused
;; Connection to 127.0.0.1#53(127.0.0.1) for mentimeter.com failed: connection refused.
mentimeter.com descriptive text "19C48D90DD"
mentimeter.com descriptive text "GAD2ZC5LWSB345TVM11C21H7QPETCIHHKHRFGMHA"
mentimeter.com descriptive text "UK-federation-domain-verification=424fbea2004943234196f456bb73c782"
mentimeter.com descriptive text "ZOOM_verify_No381zz8RaOL9HmKkOsAGQ"
mentimeter.com descriptive text "_globalsign-domain-verification=0JEhOe62Cfbif4azrMpzr_iAjSrnAtapTI28bIYXcP"
mentimeter.com descriptive text "apple-domain-verification=gjIrphBjRw1fD2LH"
mentimeter.com descriptive text "cursor-domain-verification-36b4t1=rSKB6dRpg2zobQQU1fwOC26Lz"
mentimeter.com descriptive text "detectify-verification=7bcc8e92dd6868607d3bdb0d23669447"
mentimeter.com descriptive text "facebook-domain-verification=g53js9j21nz82nfavttzvlst5xav1n"
mentimeter.com descriptive text "float-verification-code-4d50251f-2b56-48d0-9091-cf9fb0a867ce"
mentimeter.com descriptive text "google-site-verification=1pP1V27_MkQ8ccB6ubHZpi4gAPZqyjfpFHjbAYpRuWM"
mentimeter.com descriptive text "google-site-verification=AUYQMx_hmNeiShf2YhTJ2RgvMZ3_omDZLUPbyRfBEq4"
mentimeter.com descriptive text "google-site-verification=epbJI9rM2kZP6_i_ls5-AGBWQG03LCgMI1raehg1tVk"
mentimeter.com descriptive text "h1-domain-verification=h891vnyD4z9rbdjGPiL5zWDgc5qg8Q3jAEgJfjTYSG6qbxjU"
mentimeter.com descriptive text "mentimeter-a644d554-434f-4ee1-ab43-318cba0bf167"
mentimeter.com descriptive text "mixpanel-domain-verify=cfbf7776-3961-462e-94ff-01fd0e7e89d5"
mentimeter.com descriptive text "notion-domain-verification=EYVMIE1zmO3bEgA16ufvWlb9SugZIP1NCw9ds3KGRlu"
mentimeter.com descriptive text "openai-domain-verification=dv-VgjPYv00WTIOGQigVOfE6qMT"
mentimeter.com descriptive text "plooto-verification=7e6eb5b2e4e648de874bfce38ee8f7d0891764c6fa7647e087ed3f3b940eda78"
mentimeter.com descriptive text "stripe-verification=2b0cf1098f08d73f62e4a7c638688432ebddda72dbcb4a82abab9a0f60b1de06"
mentimeter.com descriptive text "stripe-verification=7413adbd48e28af3faa020f096de5518a7e9ba0018c5bfd184db44b978794899"
mentimeter.com descriptive text "v=spf1 include:_spf.google.com include:_spf.salesforce.com ~all"
mentimeter.com descriptive text "zoom-domain-verification="
```

Figure 18: Detectify verification

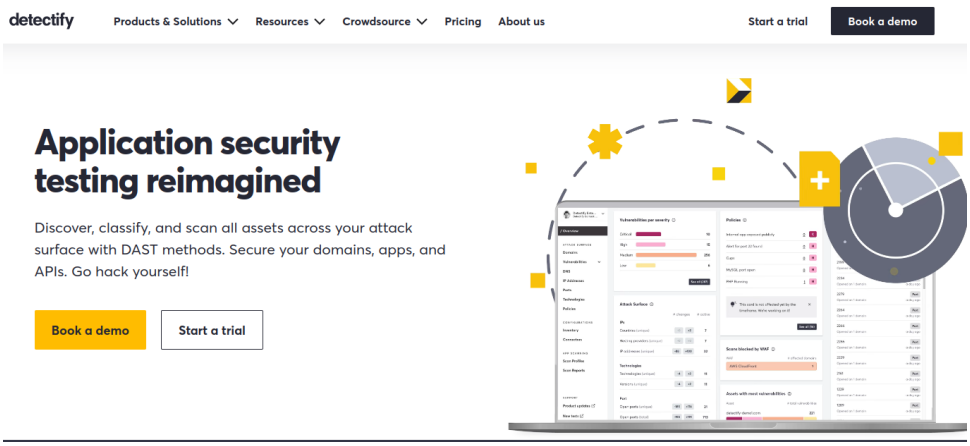

Figure 19: Detectify integration details

Detectify offers:

- Continuous compliance
- Application scanning
- API scanning
- Internal scanning
- Surface Monitoring

4.7.2 Cookie Consent Management: OneTrust (OptanonConsent)

OneTrust's OptanonConsent module manages cookie consent and GDPR/CCPA compliance.

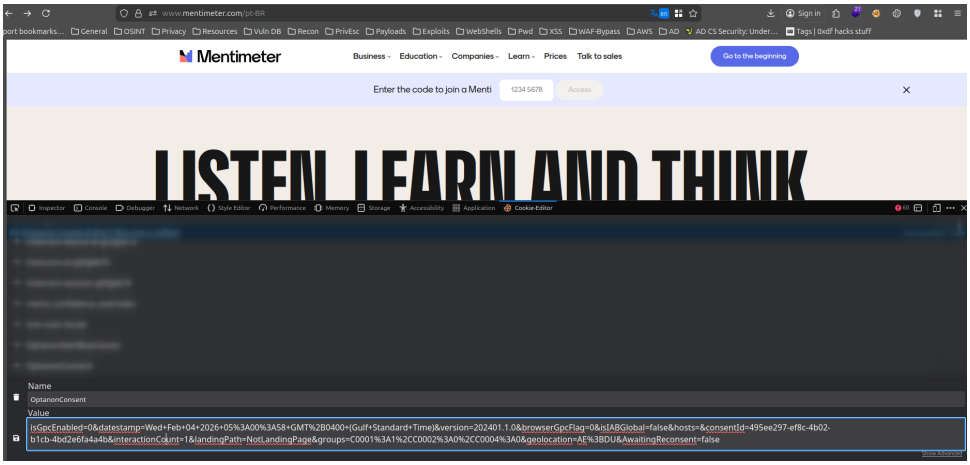

Figure 20: OptanonConsent implementation

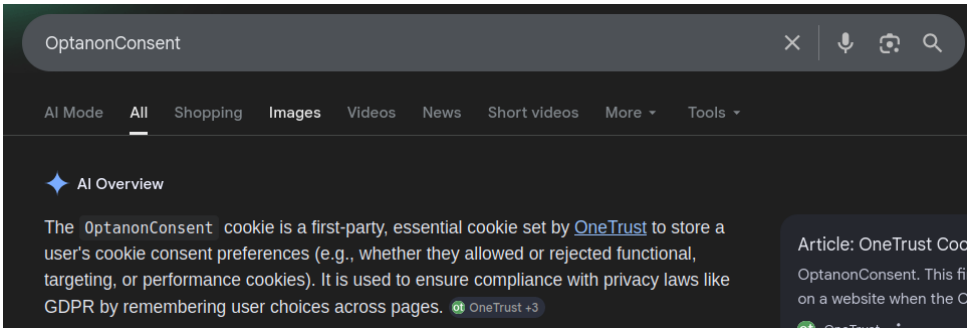

Figure 21: OptanonConsent cookie indication of usage of OneTrust

OneTrust provides:

- Regulatory solutions
- Privacy automation
- AI governance
- Consent and preference

4.8 Error Monitoring and Debugging: Sentry

Sentry handles application performance monitoring (APM) and error tracking across Mentimeter's frontend and backend systems.

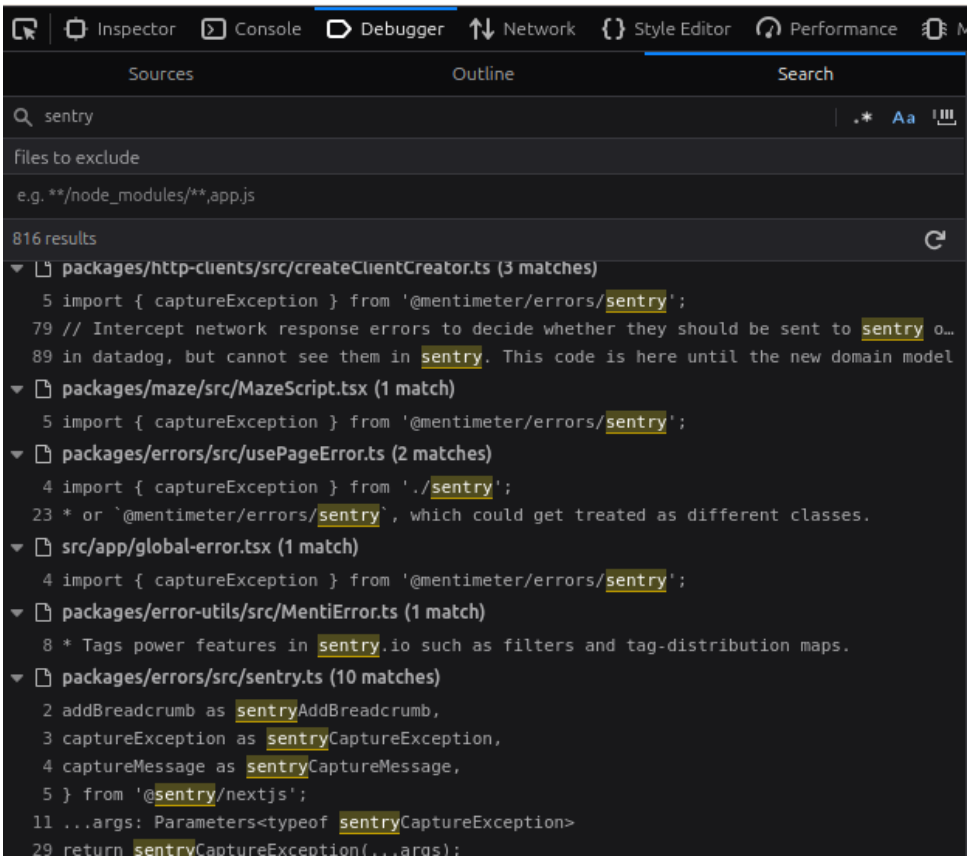

Figure 22: Sentry detected in browser devtools

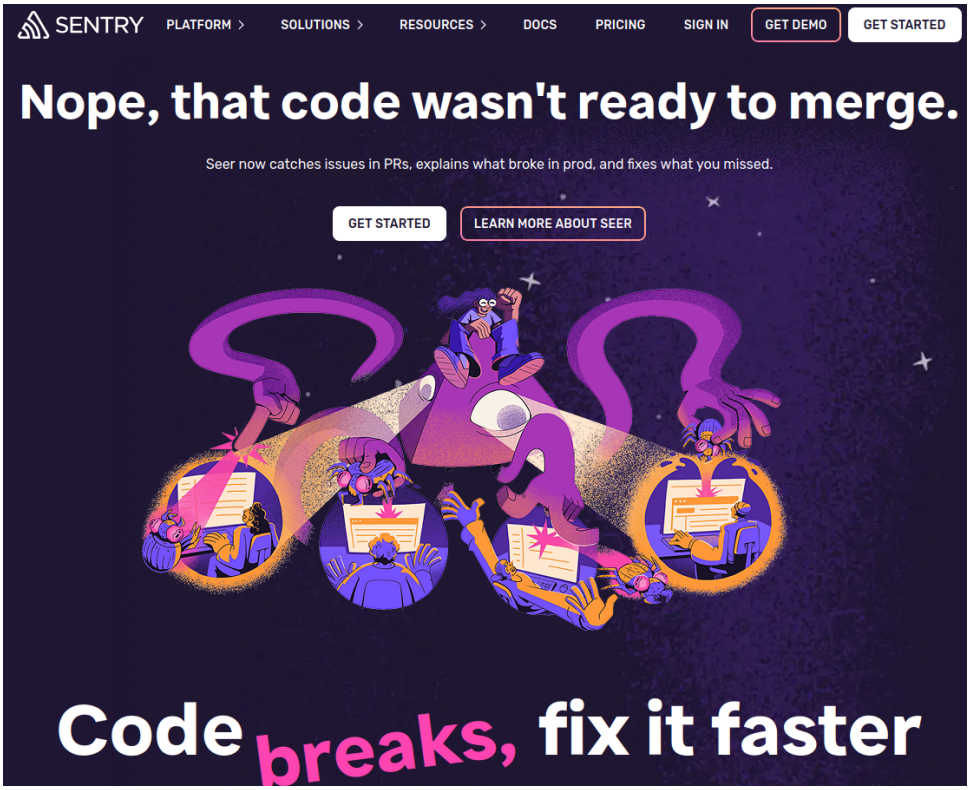

Figure 23: Sentry's landing page

Network traffic analysis revealed Sentry SDK integration, enabling:

- Real-time error alerting and notification
- Stack trace capture and source map resolution
- User impact analysis and error prioritization
- Release tracking and regression detection
- Performance monitoring for API endpoints

4.9 Internal Operations

4.9.1 Financial Management: Plooto

Plooto manages internal invoicing and accounts payable/receivable workflows.

```
> host -t TXT mentimeter.com
;; communications error to 127.0.0.1#53: connection refused
;; communications error to 127.0.0.1#53: connection refused
;; Connection to 127.0.0.1#53(127.0.0.1) for mentimeter.com failed: connection refused.
mentimeter.com descriptive text "19C48D90DD"
mentimeter.com descriptive text "GAD2ZC5LWSB345TVM11C21H7QPETCIHHKHRFGMHA"
mentimeter.com descriptive text "UK-federation-domain-verification=424fbea2004943234196f456bb73c782"
mentimeter.com descriptive text "ZOOM_verify_No381zz8RaOL9HmKkOsAGQ"
mentimeter.com descriptive text "_globalsign-domain-verification=0JEhOe62Cfbif4azrMpzr_iAjSrnAtapTI28bIYXcP"
mentimeter.com descriptive text "apple-domain-verification=gjIrphBjRw1fD2LH"
mentimeter.com descriptive text "cursor-domain-verification-36b4t1=rSKB6dRpg2zobQQU1fwOC26Lz"
mentimeter.com descriptive text "detectify-verification=7bcc8e92dd6868607d3bdb0d23669447"
mentimeter.com descriptive text "facebook-domain-verification=g53js9j21nz82nfavttzvlst5xav1n"
mentimeter.com descriptive text "float-verification-code-4d50251f-2b56-48d0-9091-cf9fb0a867ce"
mentimeter.com descriptive text "google-site-verification=1pP1V27_MkQ8ccB6ubHZpi4gAPZqyjfpFHjbAYpRuWM"
mentimeter.com descriptive text "google-site-verification=AUYQMx_hmNeiShf2YhTJ2RgvMZ3_omDZLUPbyRfBEq4"
mentimeter.com descriptive text "google-site-verification=epbJI9rM2kZP6_i_ls5-AGBWQG03LCgMI1raehg1tVk"
mentimeter.com descriptive text "h1-domain-verification=h891vnyD4z9rbdjGPiLSzWDgc5qg8Q3jAEgJfjTYSG6qbxjU"
mentimeter.com descriptive text "mentimeter-a644d554-434f-4ee1-ab43-318cba0bf167"
mentimeter.com descriptive text "mixpanel-domain-verify=cfbf7776-3961-462e-94ff-01fd0e7e89d5"
mentimeter.com descriptive text "notion-domain-verification=EYVMIE1zmO3bEgA16ufvWlb9SugZIP1NCw9ds3KGRlu"
mentimeter.com descriptive text "openai-domain-verification=dv-VgjPYv00WTIOGQigVOfE6qMT"
mentimeter.com descriptive text "plooto-verification=7e6eb5b2e4e648de874bfce38ee8f7d0891764c6fa7647e087ed3f3b940eda78"
mentimeter.com descriptive text "stripe-verification=2b0cf1098f08d73f62e4a7c638688432ebddda72dbcb4a82abab9a0f60b1de06"
mentimeter.com descriptive text "stripe-verification=7413adbd48e28af3faa020f096de5518a7e9ba0018c5bfd184db44b978794899"
mentimeter.com descriptive text "v=spf1 include:_spf.google.com include:_spf.salesforce.com ~all"
mentimeter.com descriptive text "zoom-domain-verification="
```

Figure 24: Plooto verification

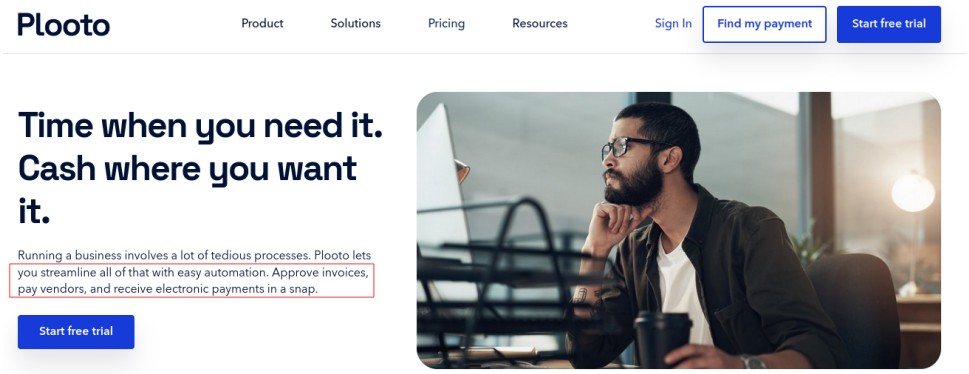

Figure 25: Plooto implementation details

4.9.2 Project Management: Float

Float serves as Mentimeter's resource management and team collaboration platform, similar to ClickUp or Asana.

```
> host -t TXT mentimeter.com
;; communications error to 127.0.0.1#53: connection refused
;; communications error to 127.0.0.1#53: connection refused
;; Connection to 127.0.0.1#53(127.0.0.1) for mentimeter.com failed: connection refused.
mentimeter.com descriptive text "19C48D90DD"
mentimeter.com descriptive text "GAD2ZC5LWSB345TVM11C21H7QPETCIHHKHRFGMHA"
mentimeter.com descriptive text "UK-federation-domain-verification=424fbea2004943234196f456bb73c782"
mentimeter.com descriptive text "ZOOM_verify_No381zz8RaOL9HmKkOsAGQ"
mentimeter.com descriptive text "_globalsign-domain-verification=0JEhOe62Cfbif4azrMpzr_iAjSrnAtapTI28bIYXcP"
mentimeter.com descriptive text "apple-domain-verification=gjIrphBjRw1fD2LH"
mentimeter.com descriptive text "cursor-domain-verification-36b4t1=rSKB6dRpg2zobQQU1fwOC26Lz"
mentimeter.com descriptive text "detectify-verification=7bcc8e92dd6868607d3bdb0d23669447"
mentimeter.com descriptive text "facebook-domain-verification=g53js9j21nz82nfavttzvlst5xav1n"
mentimeter.com descriptive text "float-verification-code-4d50251f-2b56-48d0-9091-cf9fb0a867ce"
mentimeter.com descriptive text "google-site-verification=1pP1V27_MkQ8ccB6ubHZpi4gAPZqyjfpFHjbAYpRuWM"
mentimeter.com descriptive text "google-site-verification=AUYQMx_hmNeiShf2YhTJ2RgvMZ3_omDZLUPbyRfBEq4"
mentimeter.com descriptive text "google-site-verification=epbJI9rM2kZP6_i_ls5-AGBWQG03LCgMI1raehg1tVk"
mentimeter.com descriptive text "h1-domain-verification=h891vnyD4z9rbdjGPiLSzWDgc5qg8Q3jAEgJfjTYSG6qbxjU"
mentimeter.com descriptive text "mentimeter-a644d554-434f-4ee1-ab43-318cba0bf167"
mentimeter.com descriptive text "mixpanel-domain-verify=cfbf7776-3961-462e-94ff-01fd0e7e89d5"
mentimeter.com descriptive text "notion-domain-verification=EYVMIE1zmO3bEgA16ufvWlb9SugZIP1NCw9ds3KGRlu"
mentimeter.com descriptive text "openai-domain-verification=dv-VgjPYv00WTIOGQigVOfE6qMT"
mentimeter.com descriptive text "plooto-verification=7e6eb5b2e4e648de874bfce38ee8f7d0891764c6fa7647e087ed3f3b940eda78"
mentimeter.com descriptive text "stripe-verification=2b0cf1098f08d73f62e4a7c638688432ebddda72dbcb4a82abab9a0f60b1de06"
mentimeter.com descriptive text "stripe-verification=7413adbd48e28af3faa020f096de5518a7e9ba0018c5bfd184db44b978794899"
mentimeter.com descriptive text "v=spf1 include:_spf.google.com include:_spf.salesforce.com ~all"
mentimeter.com descriptive text "zoom-domain-verification="
```

Figure 26: Float verification

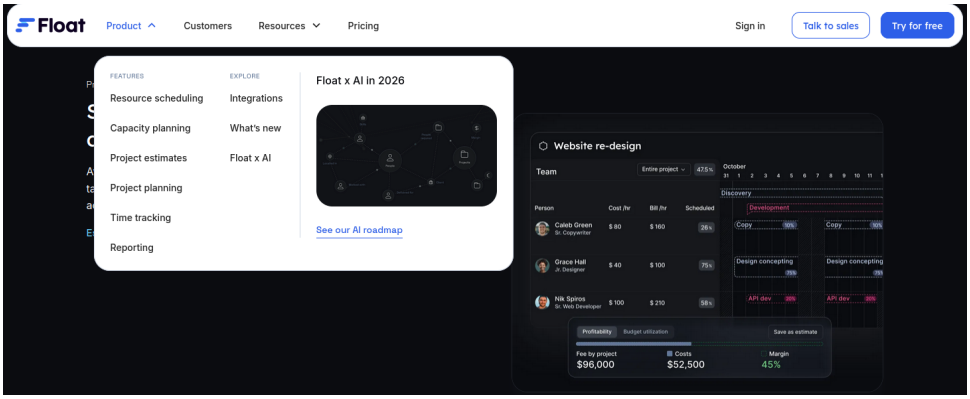

Figure 27: Float configuration

4.10 Media Optimization: Imgix

Imgix provides real-time image processing and optimization CDN services. This was confirmed via https://StackShare.io/ and network traffic analysis with BurpSuite.

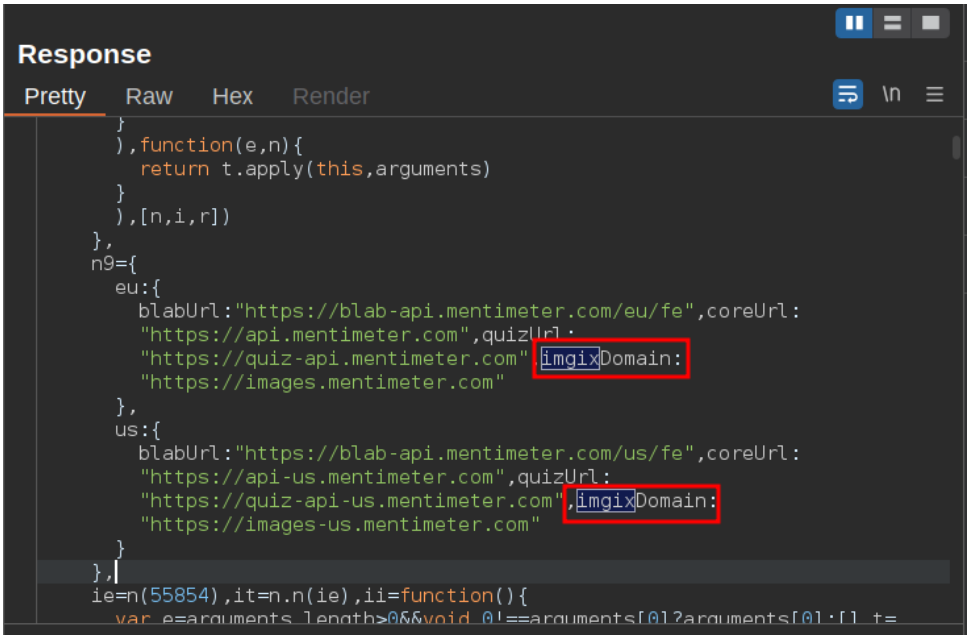

Figure 28: Imgix usage for image optimization

Imgix enables:

- On-the-fly image resizing and format conversion
- WebP and AVIF format support for modern browsers
- Responsive image generation with srcset
- Automatic compression and quality optimization
- CDN delivery for global performance

4.11 Additional Services Identified

4.11.1 Notification Infrastructure: Knock

Evidence suggests the use of **Knock** for notification orchestration and delivery.

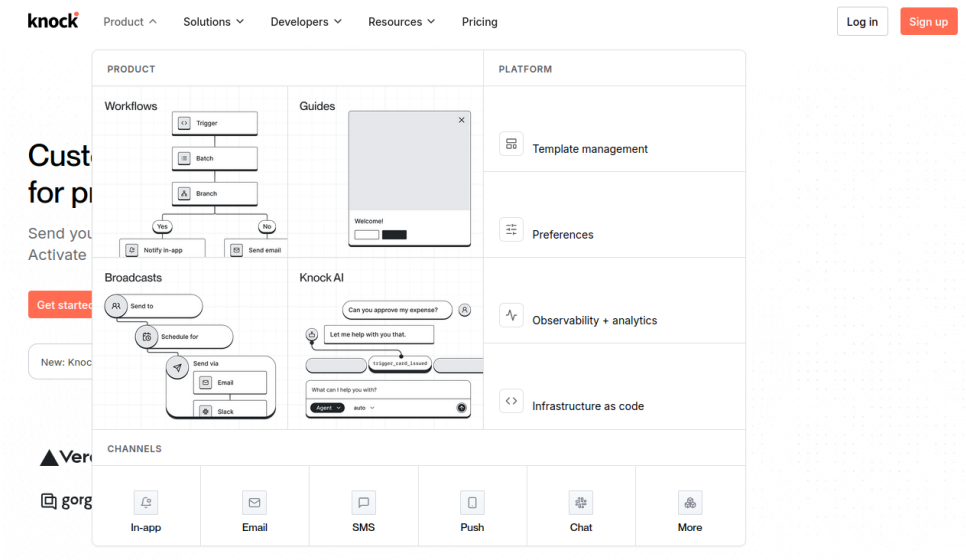

Figure 29: Knock notification service details

4.11.2 Data Warehousing: Snowflake

Snowflake appears to serve as Mentimeter's cloud data warehouse for analytics and business intelligence workloads.

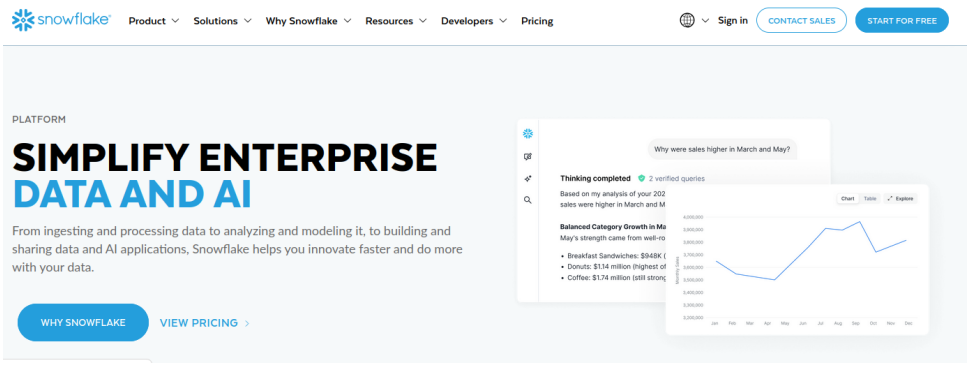

Figure 30: Snowflake data warehouse configuration

4.11.3 Document Processing: CloudConvert

CloudConvert (via LunaWeb) provides document conversion services, likely for exporting presentations to PDF, PPTX, or other formats.

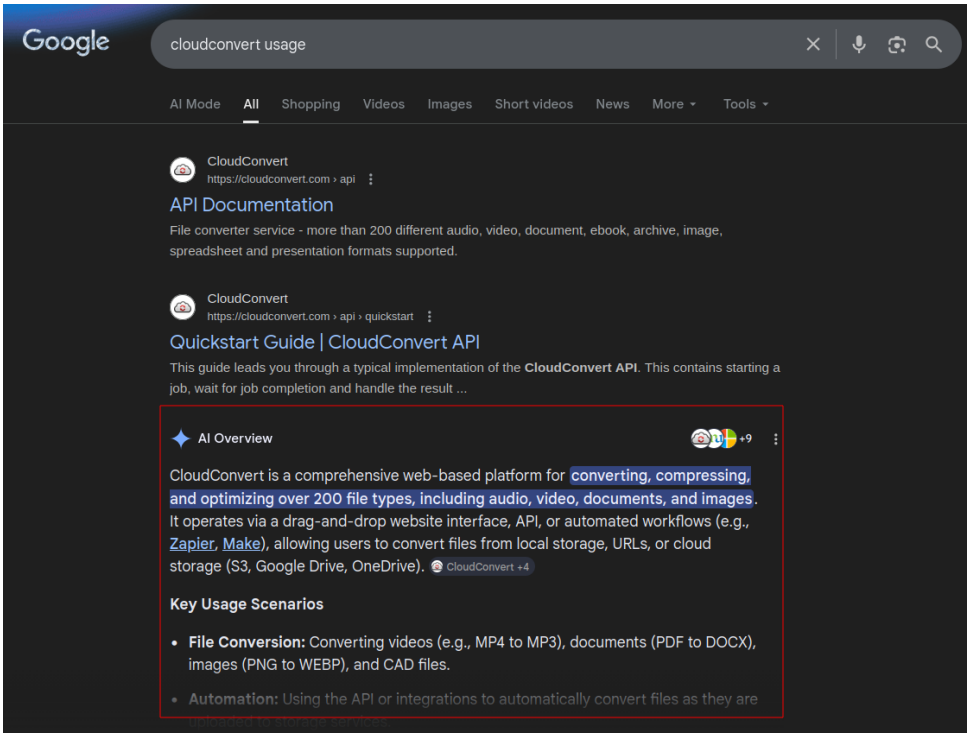

Figure 31: CloudConvert service integration

4.12 Enterprise Authentication

Analysis of the **Registration API**—specifically the response payload returned after the submission of user credentials, email, and name—revealed a default schema containing the field `SAML: false`. This indicates that the platform's architecture is pre-configured for **Security Assertion Markup Language (SAML)** integration.

Further reconnaissance identified an internal subdomain endpoint that routes directly to a Google authentication interface. This strongly suggests that **Google Workspace** serves as the primary Identity Provider (IdP) for the platform's enterprise Single Sign-On (SSO) capabilities.

This infrastructure is a key indicator of enterprise readiness, allowing the product to support B2B customers requiring:

- Centralized identity management.
- Compliance with organizational security policies.
- Streamlined user provisioning via existing Google Workspace directories.

5 Architecture and API Flow Analysis

5.1 System Architecture Overview

Based on the technology stack and service integrations identified, Mentimeter's architecture follows a modern, cloud-native microservices pattern with clear separation of concerns:

Presentation Layer:

- Next.js 14.2.35 frontend with server-side rendering
- Ragnar UI component library for consistent user experience
- Cloudflare CDN for static asset delivery

Application Layer:

- Ruby on Rails API backend
- RESTful endpoints for CRUD operations
- SAML integration for enterprise SSO

Data Layer:

- PostgreSQL for relational data (users, presentations, polls)
- S3 for media asset storage
- Snowflake for analytics data warehouse

Real-Time Communication Layer:

- Ably messaging channel-based architecture for presentation rooms

6 User Flows

6.1 Core User Experience Flow

The platform's user experience is architected into two distinct but converging workflows: the **Host** (Presenter) and the **Participant**. These pathways are optimized for different user personas and interaction patterns.

6.1.1 Host Flow

The **Host Flow** follows a comprehensive linear progression for account creation, onboarding, and content management:

1. **Acquisition:** Users enter via the Landing Page and proceed to the Signup Page.
2. **Onboarding Phase 1:** After successful signup, users are directed to the On-Boarding process where they complete their user profile via `PUT /user-profiles`, providing:
   - Organization type (e.g., business, education)
   - Department (e.g., executive-leadership-strategy)
   - Work role (e.g., freelancer, manager)
3. **Onboarding Phase 2:** Users specify their initial goal (e.g., explore, present, collaborate).
4. **First-Time User Path:** New users completing onboarding for the first time are redirected directly from On-Boarding to the Design Page, bypassing the Dashboard.
5. **Returning User Path:** Returning users proceed from On-Boarding to the Dashboard.
6. **Content Creation:** From the Dashboard, users navigate to the Design Page to build and edit presentation slides.
7. **Execution Branching:** The flow branches at the Design Page, allowing the Host to either:
   - **Invite Collaborators / Participants** to join the presentation
   - **Start Presentation** to begin the live session

6.1.2 Participant Flow

The **Participant Flow** is streamlined for minimal friction and immediate engagement:

1. **Entry Point:** Participants enter via a dedicated Landing Page.
2. **Access Methods:** Two authentication paths converge at the presentation:
   - **Access Code:** Participants enter a unique code from the Landing Page

- **Invitation Link:** Direct URL access bypassing the Landing Page

3. **Immediate Participation:** Both methods converge directly at the active **Presentation** view, bypassing account creation and authentication entirely.

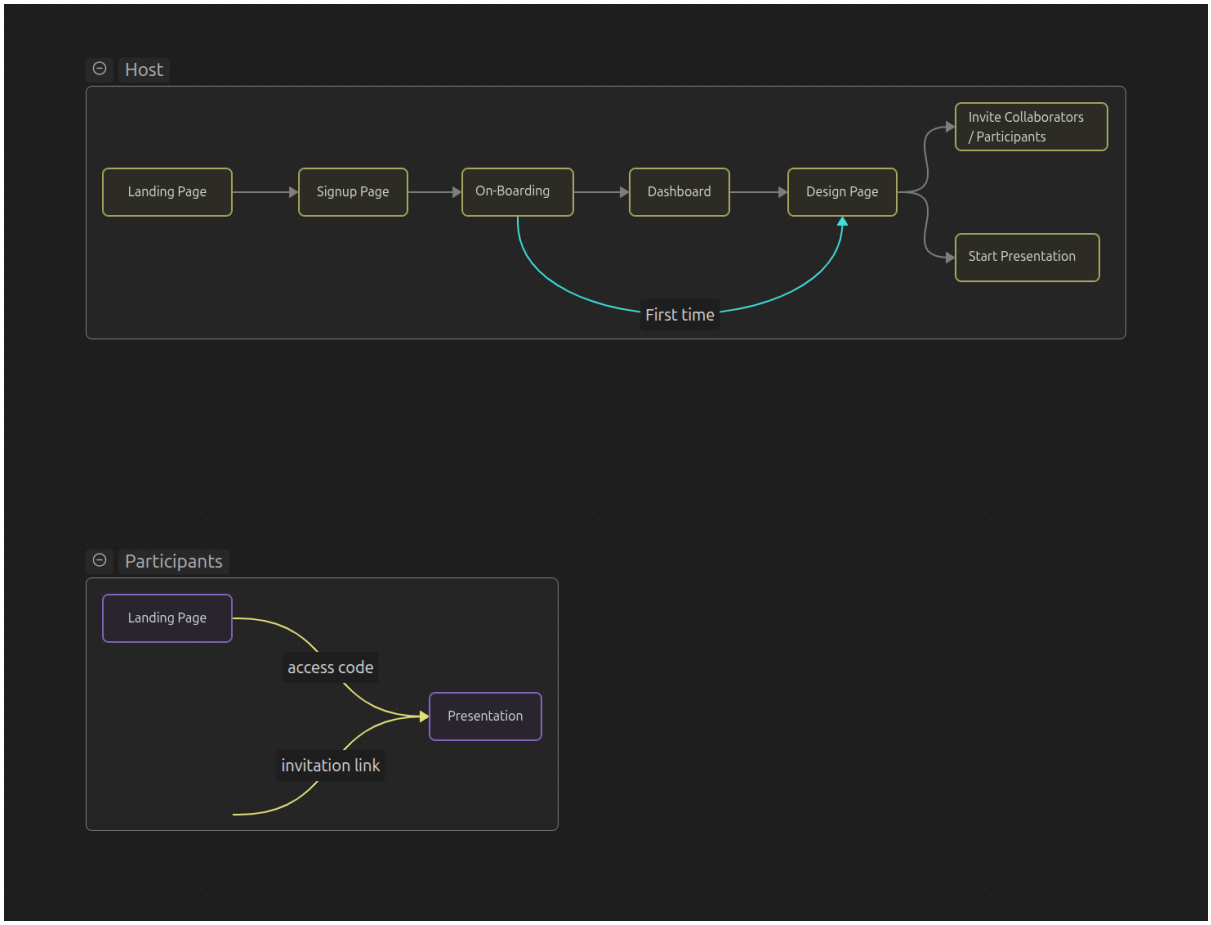

Figure 32: Host vs. Participant UX navigation paths showing dual-track architecture (View High-Resolution Version)

6.2 API Sequence Strategy

The platform employs a comprehensive RESTful API architecture for state management, user onboarding, and presentation lifecycle. Network traffic analysis reveals a sequential, resource-oriented approach with distinct phases for registration, verification, onboarding, and content manipulation.

6.2.1 Phase 1: User Registration and Authentication

Registration Request The client initiates account creation via `POST /users` with comprehensive tracking metadata:

```
POST /users HTTP/2
Host: api.mentimeter.com
Accept: application/json

{
```

```
  "email": "sokeka6662@azeriom.com",
  "password": "#,*#>n~=sHg_4k8",
  "name": "Kirubel Mamo",
  "registration_page": "pt-BR",
  "utm_first": {
    "utm_source (first)": "google",
    "utm_medium (first)": "organic",
    "utm_timestamp (first)": "2026-01-09T09:39:03.639Z"
  },
  "utm_last": {
    "utm_source (last)": "direct",
    "utm_timestamp (last)": "2026-02-04T00:09:27.655Z"
  },
  "visitor_token": "--snip--"
}
```


User Registration Payload

Registration Response The server responds with comprehensive user metadata, feature flags, and authentication tokens:


```
HTTP/2 200 OK
Content-Type: application/json;charset=utf-8

{
  "id": 39565202,
  "user_id": 39565202,
  "created_at": "2026-02-04T23:32:33+00:00",
  "name": "Kirubel Mamo",
  "email": "sokeka6662@azeriom.com",
  "token": "eyJhbGciOiJIUzI1NiJ9...",
  "intercom_hash": "3c0cdc8e26dba111a429088bb3e42d70...",
  "features": {
    "type": "registered",
    "questions_in_series": { "limit": -1 },
    "engaged_participants_limit": 50,
    "ai_enabled": true,
    "custom_themes": false
  },
  "service_urls": {
    "core": "https://api.mentimeter.com",
    "quiz": "https://quiz-api.mentimeter.com",
    "blab": "https://blab-api.mentimeter.com/eu/fe"
  },
  "is_verified": false,
  "requires_email_verification": true,
  "active_workspace_id": 7384308,
  "session_token": "SnhUJMvLy1tmfYJUWRstZZzJMYaj2qNvD-HGa0DcUgw.39565202"
}
```


User Registration Response (Truncated)

Upon successful registration, the system triggers an **OTP verification email** to the registered address.

6.2.2 Phase 2: Email Verification

OTP Verification Users complete email verification by submitting the received OTP:

```
POST /email-verification/verify-otp HTTP/2
Host: api.mentimeter.com

{
  "otp": "793VH7"
}
```

OTP Verification Request

Verification Response

```
HTTP/2 204 No Content
```

OTP Verification Response

A `204 No Content` response confirms successful verification, and the user is redirected to the onboarding flow.

6.2.3 Phase 3: User Onboarding and Profile Completion

Onboarding Step 1: Organization and Role Details Users provide organizational context via `PUT /user-profiles`:

```
PUT /user-profiles HTTP/2
Host: api.mentimeter.com

{
  "organization_type": "business",
  "department": "executive-leadership-strategy",
  "work_role": "freelancer"
}
```

User Profile Update - Organization Details

Onboarding Step 1 Response

```
HTTP/2 200 OK
Content-Type: application/json;charset=utf-8

{
  "organization_type": "business",
  "organization_size": null,
```

```
  "department": "executive-leadership-strategy",
  "work_role": "freelancer",
  "user_initial_goal": null
}
```

Profile Update Response

Upon receiving this response, the user is redirected to **onboarding page 2**.

Onboarding Step 2: User Intent Users specify their primary goal for using the platform:

```
PUT /user-profiles HTTP/2
Host: api.mentimeter.com

{
  "user_initial_goal": "explore"
}
```

User Profile Update - Initial Goal

Onboarding Step 2 Response

```
HTTP/2 200 OK
Content-Type: application/json;charset=utf-8

{
  "organization_type": "business",
  "organization_size": null,
  "department": "executive-leadership-strategy",
  "work_role": "freelancer",
  "user_initial_goal": "explore"
}
```

Complete Profile Response

Upon completion, the user is redirected to the **Presentation Dashboard**.

6.2.4 Phase 4: Presentation Design and Rendering

Dashboard and Presentation Editor Users access the presentation editor via a dedicated route:

```
GET /app/presentation/<presentation_id>/edit HTTP/2
Host: www.mentimeter.com
```

Presentation Editor Access

Editor Response

```
HTTP/2 200 OK
Content-Type: text/html; charset=utf-8
```

Editor HTML Response

The server returns the presentation editor interface as an HTML document.

Slide Data Retrieval Once the editor loads, the client fetches slide configurations via API to populate the editor:

```
GET /presentations/<presentation_id>/slides HTTP/2
Host: api.mentimeter.com
```

Slide Data Request

Slide Configuration Response The response contains comprehensive slide metadata including question types, themes, and interactive content configurations. Subsequent `POST` requests update individual slide states as the presenter edits content.

6.2.5 Phase 5: Preview and Presentation Mode

Preview Mode Activation When the presenter enters preview mode, a dedicated request is issued to render the presentation in viewer context:

```
GET /app/presentation/<presentation_id>/preview HTTP/2
Host: www.mentimeter.com
```

Preview Mode Request

This request returns the presentation view as experienced by participants, allowing the host to validate content before going live.

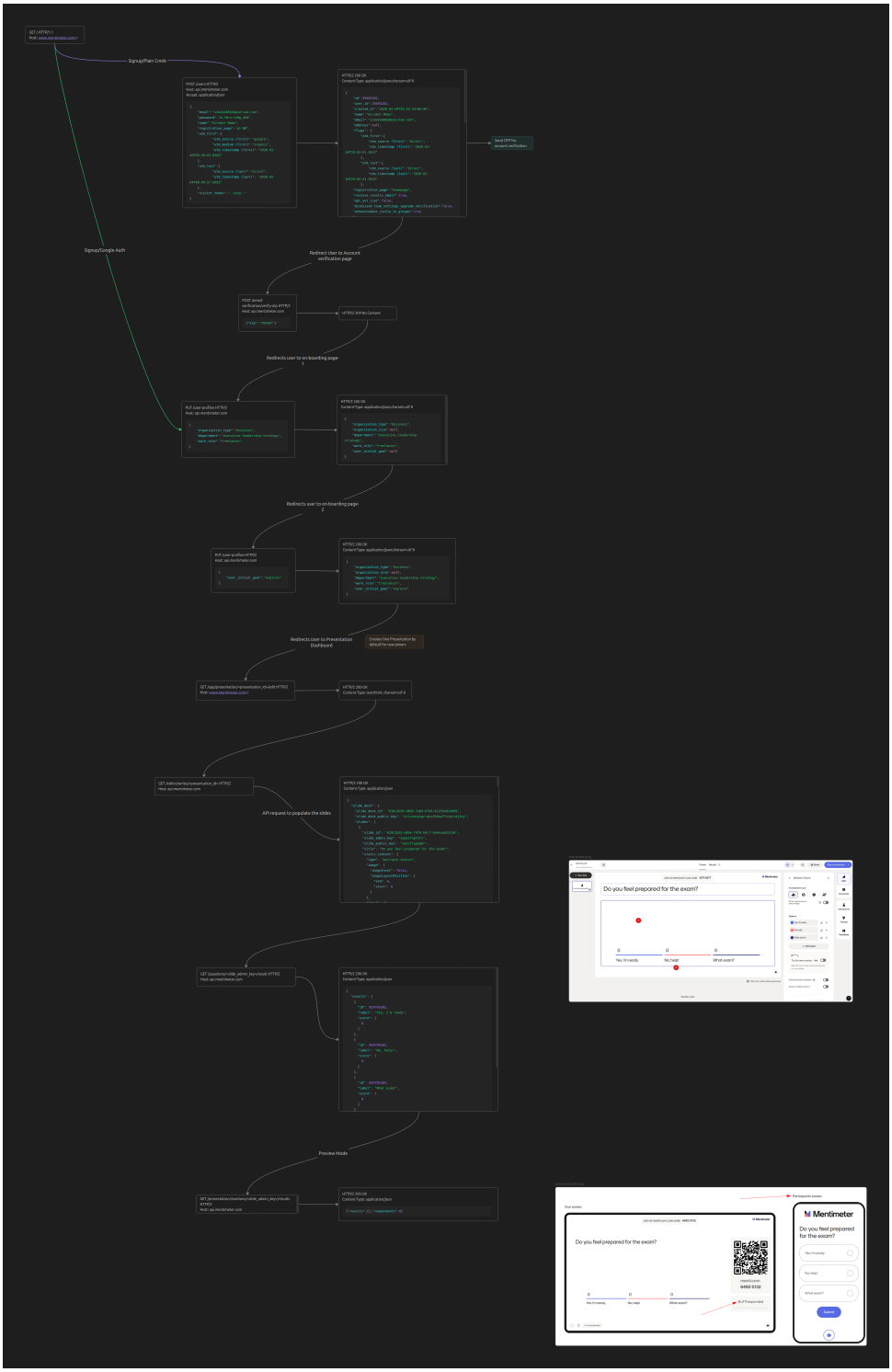

Figure 33: Sequential API request flow for user lifecycle: registration, verification, onboarding, and presentation state management (View High-Resolution Version)

6.3 Real-Time Communication Architecture: Ably Integration

The platform leverages **Ably** as its real-time messaging infrastructure to broadcast participant responses and presentation state changes to connected clients. This architecture enables bidirectional, low-latency communication between participants, the Next.js backend, and the presenter's interface.

6.3.1 Core Concepts

Participation Key A unique identifier for the presentation that authorizes users to join and participate in the live session. This key is embedded in both access codes and invitation links.

Interactive Content ID A unique identifier for each specific slide within a presentation. This granular identification allows the system to route responses to the correct slide and aggregate data in real-time.

6.3.2 Participant Response Submission Flow

When a participant submits a response (e.g., a word cloud entry, poll answer, or quiz submission), the following sequence occurs:

Step 1: Response Submission The participant's client submits the response via HTTP POST:

```
POST /core/audience/<participation_key>/responses/v2/<interactive_content_id> HTTP/2
Host: www.menti.com

{
  "response": {
    "type": "word-cloud",
    "choices": [
      {
        "interactive_content_choice_id": "019c2b7d-c61d-753e-886e-fb85edd93120",
        "value": "hello_world"
      }
    ]
  }
}
```

Participant Response Submission

Step 2: Backend Validation and Storage The **Next.js Backend** receives the response and performs:

- **Validation:** Ensures the response conforms to the expected schema for the interactive content type
- **Storage:** Persists the response to the database for aggregation and later retrieval

Step 3: Ably Publish/Emit After successful validation and storage, the backend publishes the response event to the **Ably Server**. Ably acts as a message broker, distributing the event to all subscribed clients.

Step 4: WebSocket Broadcast to Presenter The **Ably Server** broadcasts the response to the **Presenter**'s client via WebSocket (`ws://`), enabling real-time updates to the presentation interface without polling.

Step 5: HTTP Long-Polling Fallback For clients that do not support WebSocket connections (e.g., restricted corporate networks), Ably provides an HTTP long-polling fallback:

```
GET /comet/<connection_id+connection_secret>/recv?access_token=x&rnd=x HTTP/2
Host: realtime.ably.mentimeter.com
```

Ably Long-Polling Fallback Request

- **Cache Busting:** The `rnd` parameter prevents browser caching, ensuring fresh data retrieval
- **Connection Persistence:** The `connection_id` and `connection_secret` maintain stateful long-polling sessions

Step 6: UI Update Upon receiving the broadcast event (via WebSocket or long-polling), the **Presenter**'s UI updates in real-time, displaying the new response data without manual refresh.

6.3.3 Architectural Advantages

- **Scalability:** Ably handles connection management and message distribution, offloading real-time complexity from the application backend
- **Reliability:** Automatic fallback to HTTP long-polling ensures connectivity across restrictive network environments
- **Low Latency:** WebSocket-based communication minimizes roundtrip delays, providing near-instantaneous updates to the presenter

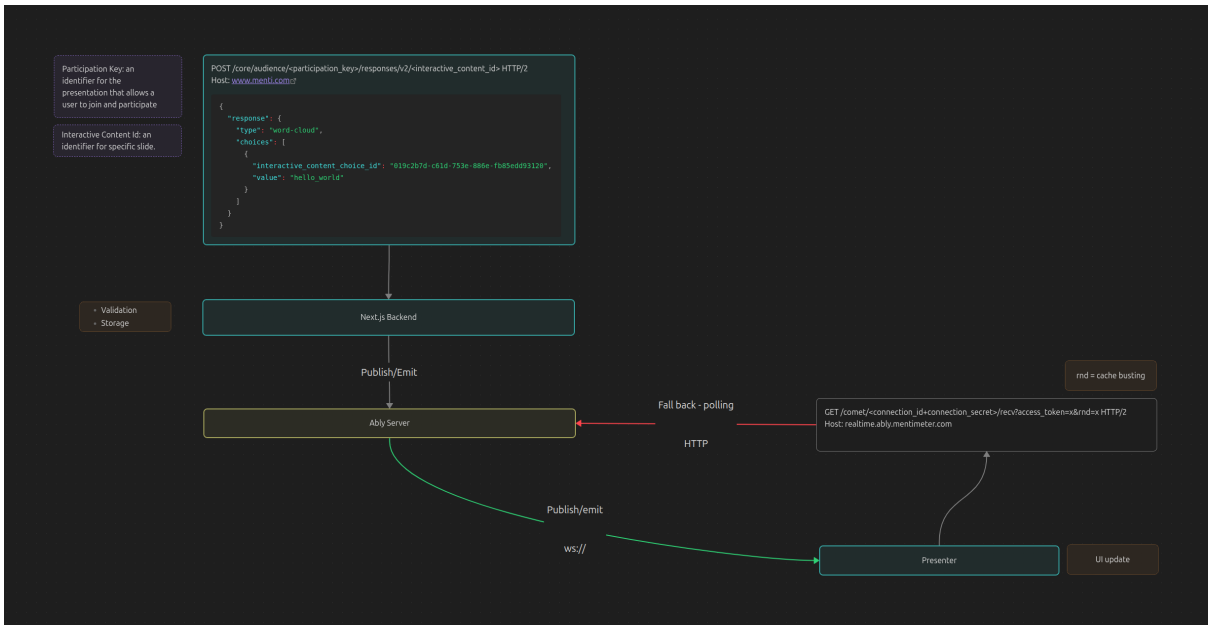

Figure 34: Real-time communication flow via Ably: participant response submission, backend validation, Ably broadcast, and presenter UI update (View High-Resolution Version)

7 Security and Infrastructure Analysis

7.1 Network Security Posture

7.1.1 Cloudflare Security Features

Mentimeter leverages Cloudflare's comprehensive security stack:

DDoS Protection:

- Layer 3/4 volumetric attack mitigation
- Layer 7 application-level attack filtering
- Automatic challenge pages for suspicious traffic

Web Application Firewall (WAF):

- OWASP Top 10 protection rules
- Custom rule sets for API endpoint protection
- Rate limiting per IP and per endpoint
- Geographic blocking if needed

Bot Detection:

- JavaScript challenge for suspected bots
- CAPTCHA for high-risk requests
- Behavioral analysis and fingerprinting

7.2 Subdomain Reconnaissance

Subdomain enumeration using flowsint revealed the following infrastructure:

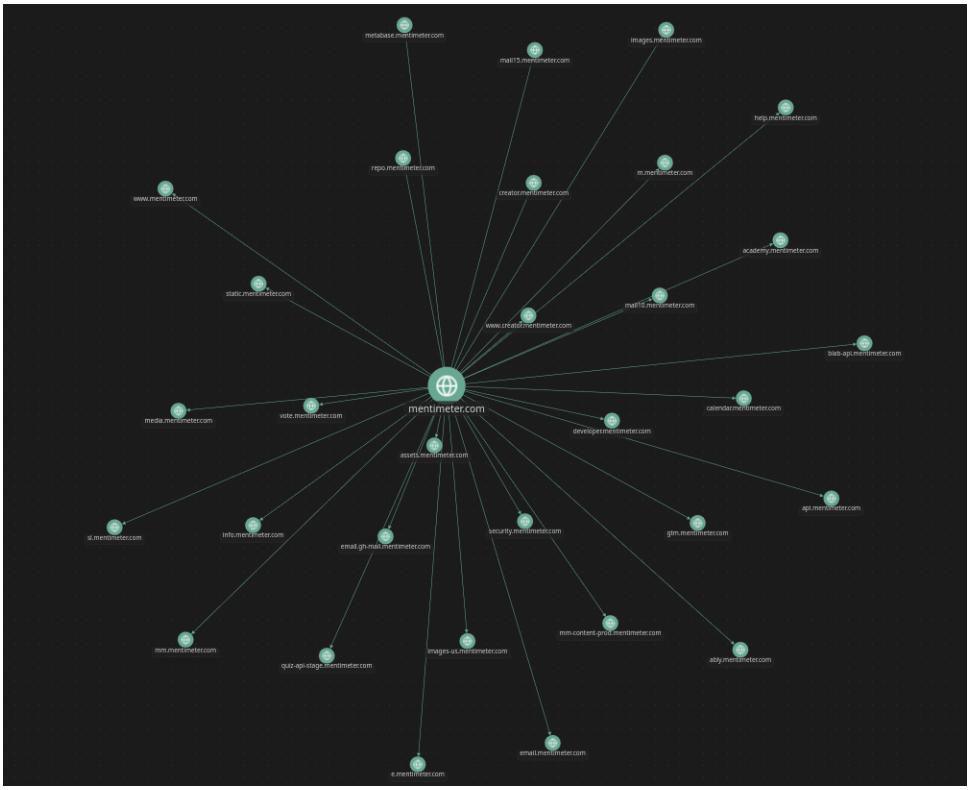

Figure 35: Mentimeter's digital assets here

Key subdomains indicate functional separation:

- `www.mentimeter.com` [200] – Main application frontend
- `api.mentimeter.com` [200] – REST API backend
- `developer.mentimeter.com` [200] – Developer documentation and API reference
- `help.mentimeter.com` [302] – Support documentation (redirects to help center)
- `academy.mentimeter.com` [200] – Educational resources and training platform
- `images.mentimeter.com` [200] – Image asset CDN (production)
- `images-us.mentimeter.com` [200] – US-region image CDN
- `images.stage-mentimeter.com` [200] – Staging environment image CDN
- `images-us.stage-mentimeter.com` [200] – US-region staging image CDN
- `static.mentimeter.com` [403] – Static assets (access restricted)
- `gtm.mentimeter.com` [400] – Google Tag Manager endpoint
- `sl.mentimeter.com` [204] – Short link service
- `mentimeter.com` [301] – Root domain (redirects)
- `m.mentimeter.com` [301] – Mobile subdomain (redirects)
- `creator.mentimeter.com` [301] – Legacy creator interface (redirects)

7.3 Data Protection and Compliance

7.3.1 Data Residency

Mentimeter's privacy documentation explicitly states data at rest is stored in **AWS Ireland (eu-west-1)**, ensuring GDPR compliance for European customers.

7.3.2 Encryption

Standard encryption practices observed here:

- TLS 1.2 for data in transit
- AWS EBS encryption for data at rest

7.3.3 Compliance Tooling

- OneTrust for cookie consent and privacy management
- Detectify for continuous vulnerability scanning
- Sentry for security error monitoring

8 Key Findings and Strategic Insights

8.1 Technology Stack Strengths

Modern, Battle-Tested Components:

Mentimeter's technology choices reflect pragmatic engineering decisions prioritizing:

1. **Developer Productivity** – Ruby on Rails and Next.js enable rapid feature development
2. **Performance** – Cloudflare CDN, server-side rendering, and Imgix optimization ensure fast load times
3. **Scalability** – AWS infrastructure with managed services supports horizontal scaling

4. **Reliability** – Ably's enterprise real-time infrastructure eliminates the need to build and maintain WebSocket infrastructure

8.2 Build vs. Buy Philosophy

Mentimeter demonstrates a clear "buy" preference for non-core infrastructure:

External Services for Commodity Features:

- Ably for real-time messaging (vs. building on Action Cable or Socket.io)
- Stripe for payments (vs. custom payment processing)
- Imgix for image optimization (vs. in-house CDN)
- Sentry for error tracking (vs. custom logging)
- Intercom for customer support (vs. building chat)

Internal Development for Differentiators:

- Ragnar UI component library (brand consistency and UX control)
- Presentation and polling logic (core business value)
- Real-time aggregation algorithms (performance-sensitive)

This approach allows the engineering team to focus resources on features that directly impact competitive differentiation rather than reinventing infrastructure.

8.3 Real-Time Architecture Considerations

Why Ably Over Self-Hosted Solutions:

The decision to use Ably instead of open-source alternatives (e.g., Redis Pub/Sub, Socket.io, Pusher Channels) reflects priorities around:

1. **Global Performance** – Ably's edge network reduces latency for international audiences
2. **Guaranteed Delivery** – Message persistence and replay for network interruptions
3. **Operational Overhead** – No need to manage WebSocket server infrastructure, load balancing, or failover
4. **Scalability** – Ably handles connection spikes during large presentations (thousands of concurrent participants)

For a competitive live polling system, real-time infrastructure is mission-critical. The Ably investment (approximately $0.50-$2.00 per 1,000 participants based on published pricing) is justified by reduced engineering complexity and improved reliability.

9 Conclusion

This technical case study provided a comprehensive examination of Mentimeter's technology stack, architecture, and operational infrastructure through systematic reconnaissance and traffic analysis. The investigation revealed a mature, well-architected system built on pragmatic technology choices that prioritize developer productivity, operational reliability, and enterprise scalability.

Key Takeaways:

1. **Strategic Use of Managed Services:** Mentimeter leverages best-in-class SaaS platforms (Ably, Stripe, Cloudflare, Sentry) to focus engineering resources on core product differentiation rather than infrastructure
2. **Real-Time Infrastructure as Competitive Moat:** The investment in Ably's enterprise real-time messaging provides reliability and global performance that would be expensive to replicate in-house
3. **Enterprise-First Security Posture:** Compliance tooling (OneTrust, Detectify), SAML support, and AWS infrastructure signal a deliberate focus on high-value enterprise customers
4. **Horizontal Integration Strategy:** Extensive third-party integrations (Intercom, Mixpanel, Imgix, Snowflake) create a composable architecture that accelerates feature development

For teams building competitive live polling systems, the most critical lesson is the importance of real-time communication infrastructure. Whether through managed services like Ably or self-hosted solutions like Socket.io, the ability to deliver sub-second updates to thousands of concurrent participants is the foundation upon which all other features are built.

The analysis also demonstrates that modern SaaS products are increasingly "assembled" from best-of-breed components rather than built entirely from scratch. This composable architecture approach reduces time-to-market and operational overhead but introduces vendor dependencies and recurring costs that must be factored into unit economics.

Ultimately, Mentimeter's success stems not from novel technology choices but from disciplined execution: selecting proven technologies, investing in enterprise compliance, and relentlessly optimizing the core user experience of seamless real-time interaction.

A References and Further Reading

1. Mentimeter Official Website: https://www.mentimeter.com
2. Ably Real-time Platform Documentation: https://ably.com/documentation
3. Mentimeter founders: https://github.com/orgs/mentimeter/people