ELEVATE
BY INSTRUCTURE

K-12 ANALYTICS
ARCHITECTURE OVERVIEW

Engineering, Security, and Operations

April 2023

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Elevate K12 Analytics Architecture

Institutions, school administrators, and teachers share many of the same goals in their roles, one being to improve student outcomes. This is often where comprehensive analytics come to the forefront of the education lifecycle, offering educators with access to comprehensive, integrated data, so they fully understand what is affecting the success of their students. Elevate K-12 Analytics is the perfect analytic application that combines data from key district data sources and provides access to highly interactive visualizations of integrated data so educators can measure, manage, and improve student outcomes. Rich and flexible analytics make it easy for users to customize, personalize, and share reports and visuals based on their own classroom needs without the need for programming skills or being a report wizard. We even include hundreds of charts “out of the box” for enrollment, attendance, behavior, academic achievement and growth, grade reporting, course performance, graduation plan tracking, and progress trends. That means data can be viewed and categorized in numerous ways, such as by demographics, program enrollment, student characteristics, schools, special populations, or teachers. Sadly, it means saying goodbye to stale reports and siloed information (sorry, not sorry) because we want to provide our customers with up-to-date data so educators can quickly identify programs and students that need attention, as soon as they need it - something that is becoming increasingly crucial in a paced education lifecycle.

The following supplemental document describes the Elevate K-12 Analytics architecture for those curious technical types who love getting into the detail of just how we get the information to your fingertips.

Hosting

Instructure’s product family, including Elevate K-12 Analytics, is hosted in the cloud by Instructure and delivered over the internet through the world's most trusted public cloud provider, Amazon Web Services (AWS). The basic building blocks of AWS include services such as Elastic Compute Cloud (EC2), Elastic Load Balancing (ELB), Auto Scaling Groups (ASG), Simple Storage Service (S3), Elastic Block Store (EBS), Virtual Private Cloud (VPC), Simple Email Service (SES), and Identity and Access Management (IAM). We also use advanced AWS platform capabilities including Amazon Kinesis, AWS Lambda, AWS Fargate, AWS Elastic Kubernetes Service (“EKS”), and Amazon Relational Database Services (“RDS”). Instructure’s products are designed to make full use of the real-time redundancy and capacity capabilities offered by AWS, running across multiple availability zones in regions throughout the world. Primary storage is provided by Amazon S3, which is designed for durability exceeding 99.99999999%.

Hosting Regions

As a product only offered in the U.S., Elevate K-12 Analytics (and Instructure's underlying Elevate Data Hub technology, i.e., the Ed-Fi ODS/API) are fully hosted, subscription-based cloud offerings hosted on AWS in the AWS-East and AWS-West regions in the U.S.

Security Program

Instructure works diligently to protect our customers, our people, data, and systems. Instructure's security program is overseen by our Chief Information Security Officer who is accountable for the implementation and execution of company policies, audits, and ensuring the security program conforms to the relevant ISO/IEC 27000, AICPA Trust Services Principles and Criteria (as applicable as part of compliance with SOC 1 and SOC 2), NIST SP 800-53 r4 (as applicable), and other applicable security standards. Members of Instructure's security team have many years of experience with security audits by major corporations and government agencies. Our technical staff are dedicated to servicing, managing, and securing operating systems, applications, drivers and hardware devices.

Instructure's information security policies and standards are based on information security best practices as set forth by the International Organization for Standardization's (ISO) 27000 suite of standards, NIST's 800-53 suite of controls, and the AICPA's Trust Service Principles and Criteria.

Elevate K-12 Analytics is currently undergoing SOC 2 Type II certification.

In addition to these measures, the Amazon Web Services infrastructure on which Elevate K-12 Analytics is hosted has a variety of formal accreditations. Some of the many certifications include:

- SOC 1 Type II (ISAE 3402), SOC 2 Type II, and SOC 3 Type II reports
- ISO 9001, 27001 (CSA Star Level 2), 27017, and 27018 certified
- Level 1 PCI-DSS service provider
- FISMA-Moderate operation level
- GDPR ready, FERPA compliant (shared responsibility model)
- Cyber Essentials PLUS certification

For additional information about AWS security certifications and standards compliance, please refer to http://aws.amazon.com/security and http://aws.amazon.com/compliance/.

Product Security

The following is an overview of Elevate K-12 Analytics product security measures:

- All data is encrypted in transit with TLS v1.2/1.3
- All data is stored at rest using the AWS symmetric algorithm (AES-256-GCM).
- Host-based vulnerability scans are performed at least quarterly on all external-facing systems. Critical and high vulnerabilities are tracked to remediation.
- Minimal PII is captured, and Instructure maintains a Data Protection Policy which is reviewed annually.
- Instructure is compliant with the EU's national data privacy and protection law, the General Data Protection Regulation (“GDPR”).

Tech Stack / Languages

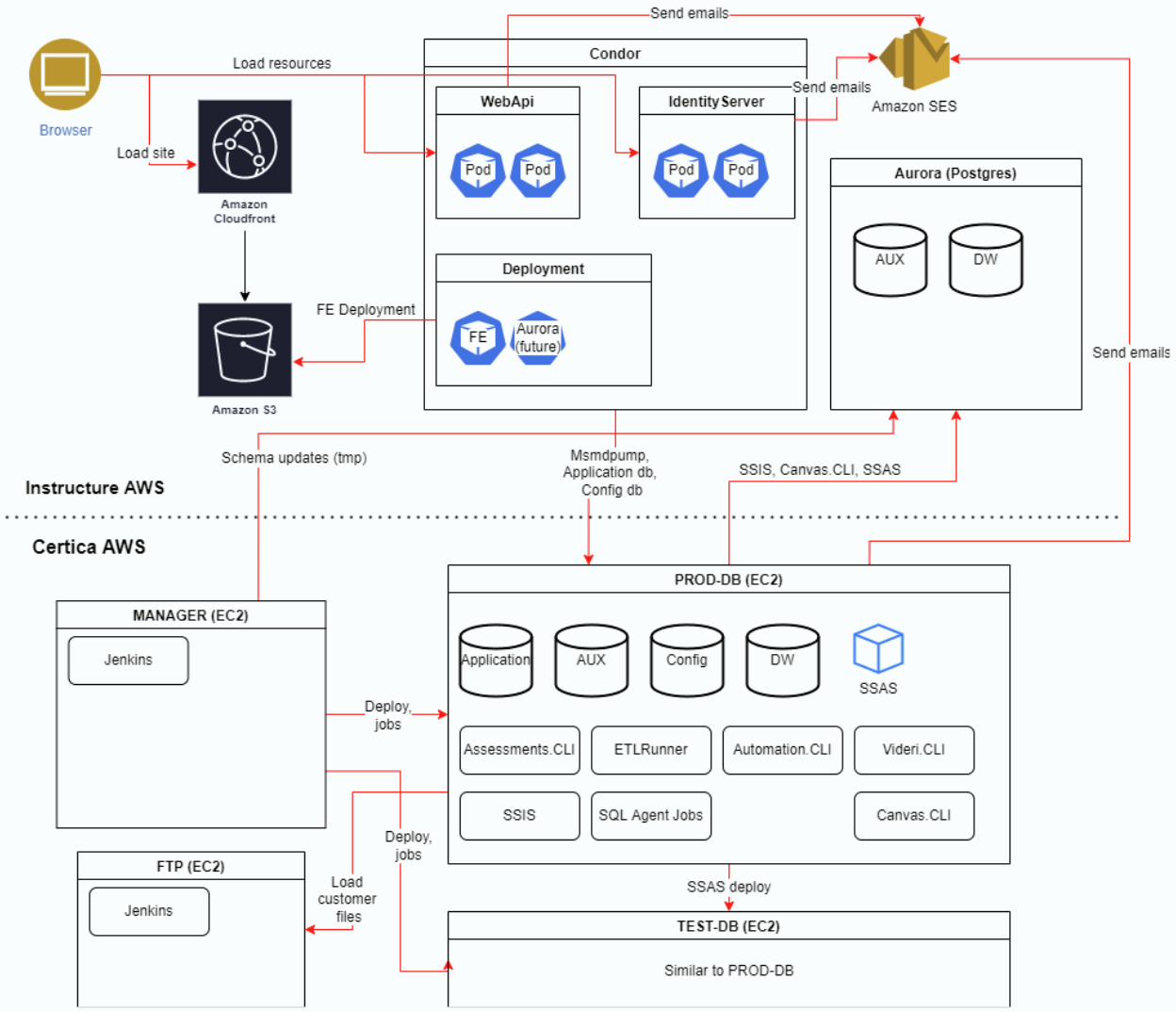
Elevate K-12 Analytics is made up of several components including:

- The backend application is .NET. Additionally, we are using a variety of Microsoft DB technologies (SQL Server, SSIS, SSAS)
- The Elevate K-12 Analytics frontend is a combination of Angular + React.

Architecture and Data Flow Diagram (AWS)

ELEVATE K-12 Analytics

Last Updated: January 2023



Data Sources

Elevate K-12 Analytics provides cross-district data analytics and aggregates multi-year data from:

- The district's SIS
- Mastery Connect
- state summative assessments
- PSAT, SAT, ACT, and AP scores
- curriculum assessment scores
- and other external assessment results

API

Integrations with Elevate K-12 Analytics are typically done via the Ed-FI API.

Elevate K-12 Analytics is a SaaS application that includes a hosted Ed-Fi operational data store (ODS). Data in the ODS stays in sync with district source system data by syncing via the Ed-Fi API, so K-12 Analytics always shows current data and metrics, which further enables the district to make data-driven decisions. Elevate K-12 Analytics provides an integrated view of student, classroom, and district data by utilizing the Ed-Fi data standard. Because K-12 Analytics leverages data from multiple source systems (e.g., SIS, behavior, assessment, transportation, nutrition), it provides teachers and administrators with advanced analytic capabilities to enable improvement through data-driven, actionable insights.

K-12 Analytics is fully aligned and integrated with the Ed-Fi data standard and technology for optimal scaling and cost-effective data integration. With this approach, K-12 Analytics automatically integrates with any system that supports the Ed-Fi API. For systems that do not currently support the Ed-Fi API, Instructure provides data loaders to map files into the Ed-Fi standard for loading into Elevate Data Hub, the hosted Ed-Fi ODS underpinning K-12 Analytics, as an interim strategy until such systems directly support the Ed-Fi API.

Learning Tools Interoperability (LTI)

Elevate K-12 Analytics is connected to Canvas via LTI. LTI integration between Canvas and Elevate K-12 Analytics supports SSO access.

Once the integration is complete, the user will see an "Analytics" button in the Global Navigation bar of Canvas LMS. Every time a user clicks the Analytics button, the Elevate K-12 Analytics window will render within Canvas.

Third-Party Integrations

Instructure powers Elevate K-12 Analytics by utilizing the open-source Ed-Fi data model and Operational Data Store (ODS) as its central data warehouse or "hub" to power its analytics at scale.

Ed-Fi eliminates the “tech debt” that other vendors carry in maintaining each institution’s custom data integrations. Traditional BI vendors must commit up to 80% of their product engineers' time to maintaining hundreds or thousands of custom integrations for hundreds or thousands of varying applications across all customers - and the more customers they bring on, the more onerous this problem becomes.

SIS Integration

Elevate K-12 Analytics uses the Ed-Fi API to integrate with several SIS's such as Aeries, Aspen, eSchoolPlus, Focus, Infinite Campus, PowerSchool, Skyward, Synergy, and Tyler SIS (v10 and v9).

Assessment Integration

Elevate K-12 Analytics also takes advantage of both the Ed-FI API and Ed-FI loader to support integrations with several assessment solutions such as FastBridge, HMH (math and reading), CLI Engage (Engage Kindergarten and Circle Progress Monitoring), IB, PSAT, Renaissance, STAR, SAT, and many more.

Additionally, Elevate K-12 Analytics integrates with several state summative assessments for math, ELA, Science, and English Learner.

A complete list of supported integrations can be found here:
https://community.canvaslms.com/t5/Elevate-K-12-Analytics-Resource/Elevate-K-12-Analytics-Integration-Availability/ta-p/460009

Backup & Restore

Customer data is ingested by Elevate K-12 Analytics for analysis and therefore Elevate K-12 Analytics is not considered a source of truth for customer data. However, we use AWS Backup to create backups of EC2 instances (user configuration, dashboards, and settings, etc.) as follows:

- AWS daily backups for **15 days**
- AWS monthly backups for **1 year.**

Compliance

Accessibility

Instructure is committed to developing a product that is accessible to all school district staff and we will continue to work toward meeting WCAG 2.1 Level AA and Section 508 standards for Elevate K-12 Analytics. Regular testing is conducted to identify any conformance issues, with processes in place for timely remediation of accessibility issues that are identified. Testing is regularly conducted using automated tools, assistive technology (such as screen readers, keyboard testing, etc.), and coding best practices.

Personally Identifiable Information (PII)

Elevate K-12 Analytics inherits data permission levels set by the SIS. Elevate K-12 Analytics can also import data types described in the Ed-Fi Standard. Users only have access to see student PII data that the SIS allows. In addition, roles can be defined by the admin with associated permission levels, including the district level, school level, teacher level and no PII. Users can share reports to specific users or defined roles.

Instructure ensures that all PII is encrypted when in transit and when stored at rest. We also restrict access only to individuals who need access using roles-based authentication and authorization for customer access, and access by those of our employees who have an explicit need to access the information as part of their role supporting our customers.

Privacy

We believe that privacy is a fundamental human right and take our responsibility very seriously. We are committed to protecting your privacy and have a dedicated privacy and security program. Our customers (educational institutions and companies) entrust us as data stewards for their users' information. We generally process user data at the direction of our customers to provide our products and services. Additionally, Our Privacy Center provides FAQs on how we uphold our privacy commitments.

For our complete commitment to privacy, please see: https://www.instructure.com/privacy-cent