Google Cloud

Google Cloud for Financial Services

Streamline regulatory reporting requirements with Google Cloud

Google Cloud gives institutional and wholesale trading organizations scale and smart analytics to reimagine their old and new regulatory reporting systems with modern cloud-based architectures.

The Consolidated Audit Trail (CAT), an upcoming regulatory reporting obligation, will increase the compute power and storage requirements for U.S. broker-dealer firms. While it's a significant undertaking, CAT offers an opportunity to streamline older regulatory reporting systems, such as those supporting Order Audit Trail System (OATS), Electronic Blue Sheet (EBS), Large Trader Reporting, CBOE Rule 8.9 and PHLX Rule 1022,[1] as well as retire legacy systems used to support these requirements.

> " A cloud-based, on-demand high-performance architecture helps efficiently transform, store, and analyze all data."

Anuj Malik
Principal, Banking and Capital Markets
Deloitte Consulting LLP

According to Deloitte, "in addition to regulatory mandates, trade analytics and surveillance can take advantage of a flexible big compute, leading edge data platform that enables experimentation with and use of more advanced algorithms. <...> A cloud-based, on-demand high-performance architecture **helps efficiently transform, store, and analyze all data."**[2]

Shifting to a modern cloud-based architecture makes ingesting high volumes of equities and options data from multiple sources less complex. Having this data in a single cloud-based system unlocks transformative possibilities beyond the easy submission of required reporting: Predictive analytics, trade surveillance, company-wide compliance monitoring and more.

Powering partner solutions for CAT

Google Cloud partners with consultancies, such as **Deloitte**, on rearchitecting trade surveillance and regulatory reporting platforms for some of the major broker dealers. Google Cloud also powers out-of-the-box solutions, such as **Kx for CAT,** an enterprise-grade application designed to accommodate the sophisticated and complex CAT reporting transformations historically associated with bespoke implementations.

> " Kx for CAT is a fully auditable CAT reporting solution, deployable on the cloud, that provides the analyst with an elegant toolset for reporting, error remediation and business intelligence."

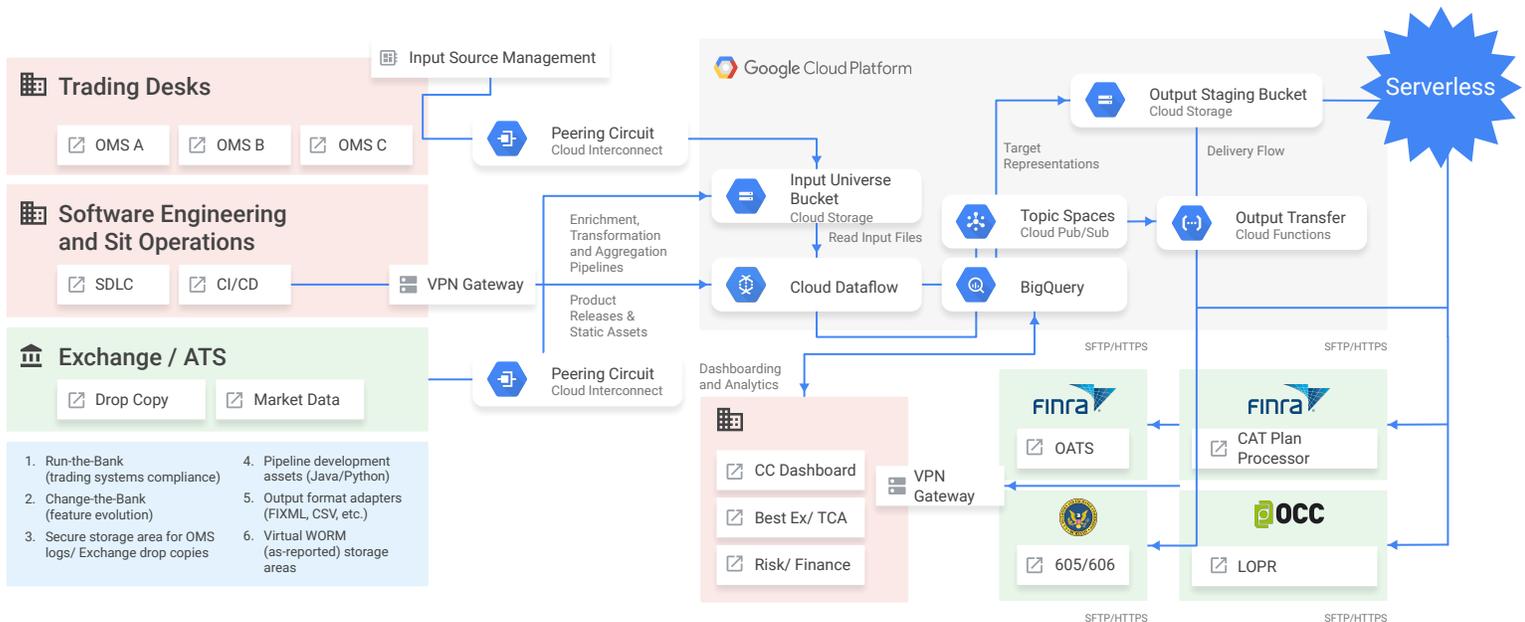**Pat Brazel**
Chief Commercial Officer, Kx

[1] https://www.catnmsplan.com/wp-content/uploads/2017/03/p551991.pdf
[2] Deloitte, Seizing the Opportunities: The Consolidated Audit Trail, 2017

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Six reasons to use Google Cloud for CAT compliance

1 CAT Expertise: Google Cloud supported the FIS' bid to build the CAT, one of three finalists in the bid.[3] We bring a team of executives with deep experience in regulatory reporting.

2 Best-in-class security: Our products regularly undergo independent verification of security, privacy, and compliance controls. Your CAT source data can be encrypted both in transit and at rest using encryption keys provided by Google Cloud, or managed by customer-owned keys, ensuring your CAT data is safe at all times.

3 Hybrid & multi-cloud: With Anthos, the CAT solution can be deployed and managed in hybrid or multi-cloud environments in a unified, secure and agile way. Anthos also provides a consistent set of APIs based on open-source technologies like Kubernetes, Istio, and Knative, empowering developers and operators to learn one stack that works across cloud providers.

4 Fully managed no ops: The CAT solution's serverless architecture leverages Google Cloud's storage, databases, and machine learning, allowing you to deploy functions or applications as source code or as containers. The solution can increase operational efficiency, while ensuring that availability and security are not compromised.

5 Embedded Machine Learning: ML functions can support predictive error identification and correction, best execution, transaction cost analysis, profitability, and routing among others.

6 Best of Google: Our culture of openness and collaboration tools can help reimagine how your operations team work together and manage regulatory reporting in a more efficient and streamlined way.

Reference architecture: Regulatory reporting (CAT) on Google Cloud

Trading Desks
- OMS A
- OMS B
- OMS C

Software Engineering and Sit Operations
- SDLC
- CI/CD

Exchange / ATS
- Drop Copy
- Market Data

1. Run-the-Bank (trading systems compliance)
2. Change-the-Bank (feature evolution)
3. Secure storage area for OMS logs/ Exchange drop copies
4. Pipeline development assets (Java/Python)
5. Output format adapters (FIXML, CSV, etc.)
6. Virtual WORM (as-reported) storage areas

Input Source Management

Peering Circuit — Cloud Interconnect

VPN Gateway

Peering Circuit — Cloud Interconnect

Enrichment, Transformation and Aggregation Pipelines

Product Releases & Static Assets

Google Cloud Platform

Input Universe Bucket — Cloud Storage

Read Input Files

Cloud Dataflow

Topic Spaces — Cloud Pub/Sub

BigQuery

Target Representations

Output Staging Bucket — Cloud Storage

Delivery Flow

Output Transfer — Cloud Functions

Serverless

Dashboarding and Analytics
- CC Dashboard
- Best Ex/ TCA
- Risk/ Finance

VPN Gateway

FINRA
- OATS

FINRA
- CAT Plan Processor

OCC
- LOPR

- 605/606

SFTP/HTTPS

[3] https://cloud.google.com/bigtable/pdf/FISConsolidatedAuditTrail.pdf

Get started by scheduling a deep dive with Google Cloud experts to assess your opportunity. Google Cloud for Financial Services
cloud.google.com/solutions/financial-services