AWS re:Invent

ANT216-R

ML analytics with Amazon QuickSight

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Amazon Web Services

AWS re:Invent

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aws

Agenda

Amazon QuickSight overview

Let’s build some machine learning (ML) insights

Insights for everyone



No servers to manage

Amazon QuickSight is a fully managed cloud service. There is no infrastructure to maintain or upgrade and no upfront cost.



Pay for what you use

Instead of buying costly licenses for all your users, Amazon QuickSight allows you to share dashboards and reports and only pay when users access them.



Scalable

From 10 users to 10,000, Amazon QuickSight seamlessly grows with you with no need for additional servers or infrastructure.



Fully integrated

Amazon QuickSight integrates with your other AWS services and data sources, giving you everything you need to build an end-to-end cloud analytics solution.



ML Insights

With ML-powered anomaly detection, forecasting, and automated yet customizable natural language narratives, you can delight your customers with never-before-seen functionality in a BI tool.

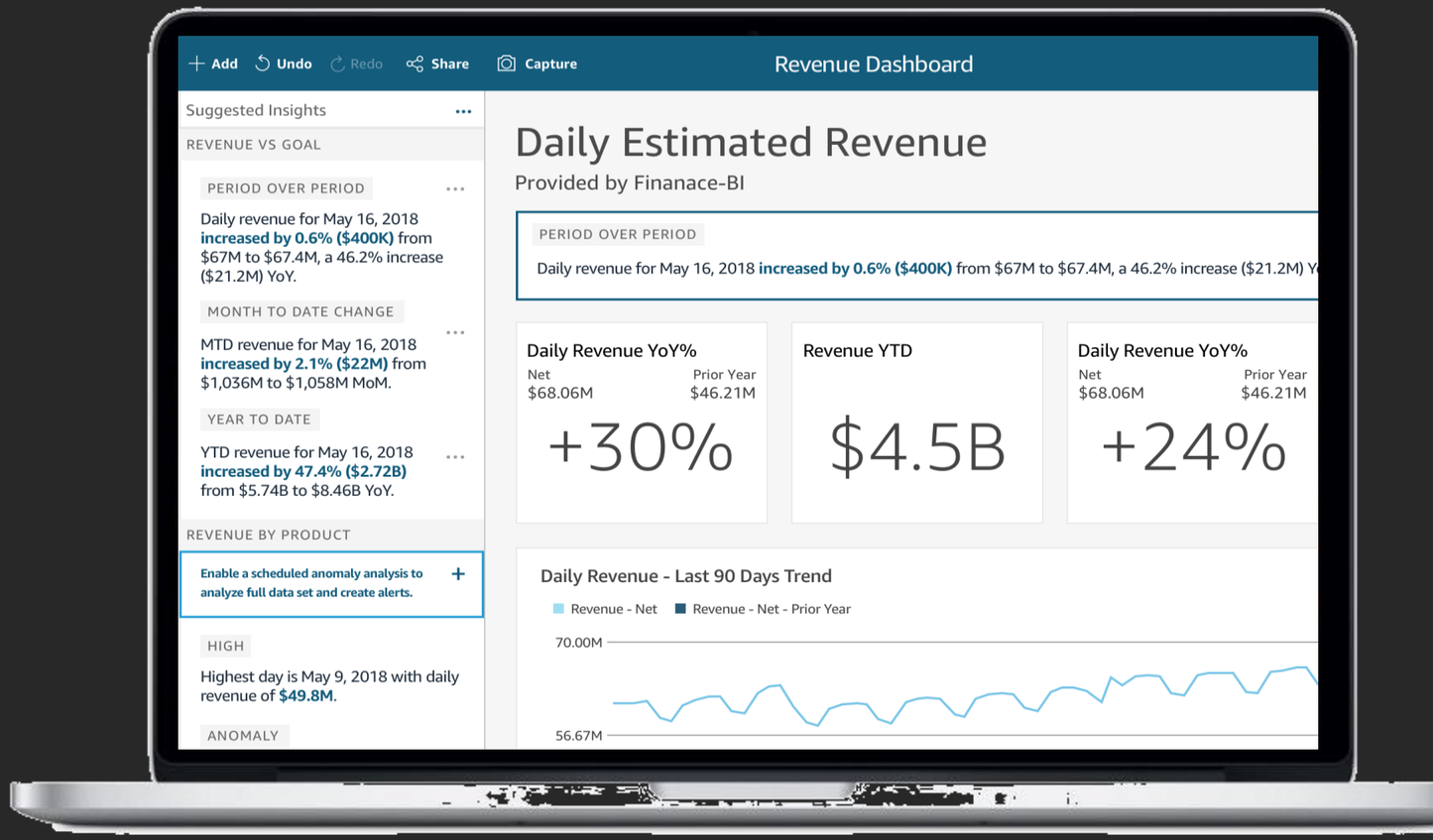


Dashboard embedding

Eliminate dashboard development and maintenance activity by embedding dashboards built in Amazon QuickSight. Secure (SSO auth), easy (JavaScript SDK + user/group APIs), and cost-effective (pay-per-session).

ML Insights

- ML-powered anomaly detection
- ML-powered forecasting
- Auto-generated natural language narratives and summaries
- ML-powered sentiment analysis (coming)
- ML-powered entity extraction (coming)



ML Insights

1. **ML-powered anomaly detection** to help customers uncover hidden insights by continuously analyzing across billions of data points



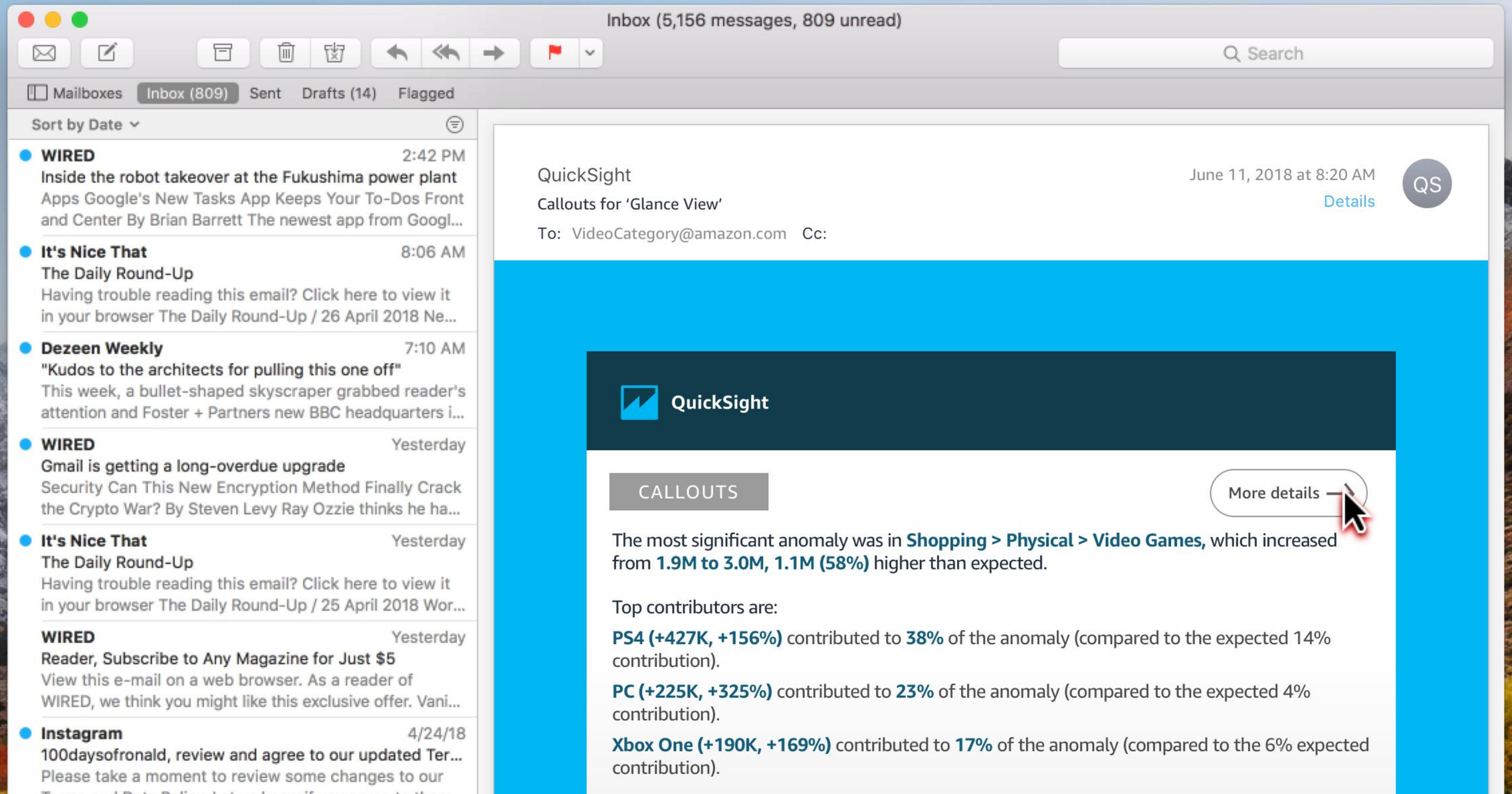
2. **ML-powered forecasting** and what-if analysis to predict key business metrics with point-and-click simplicity



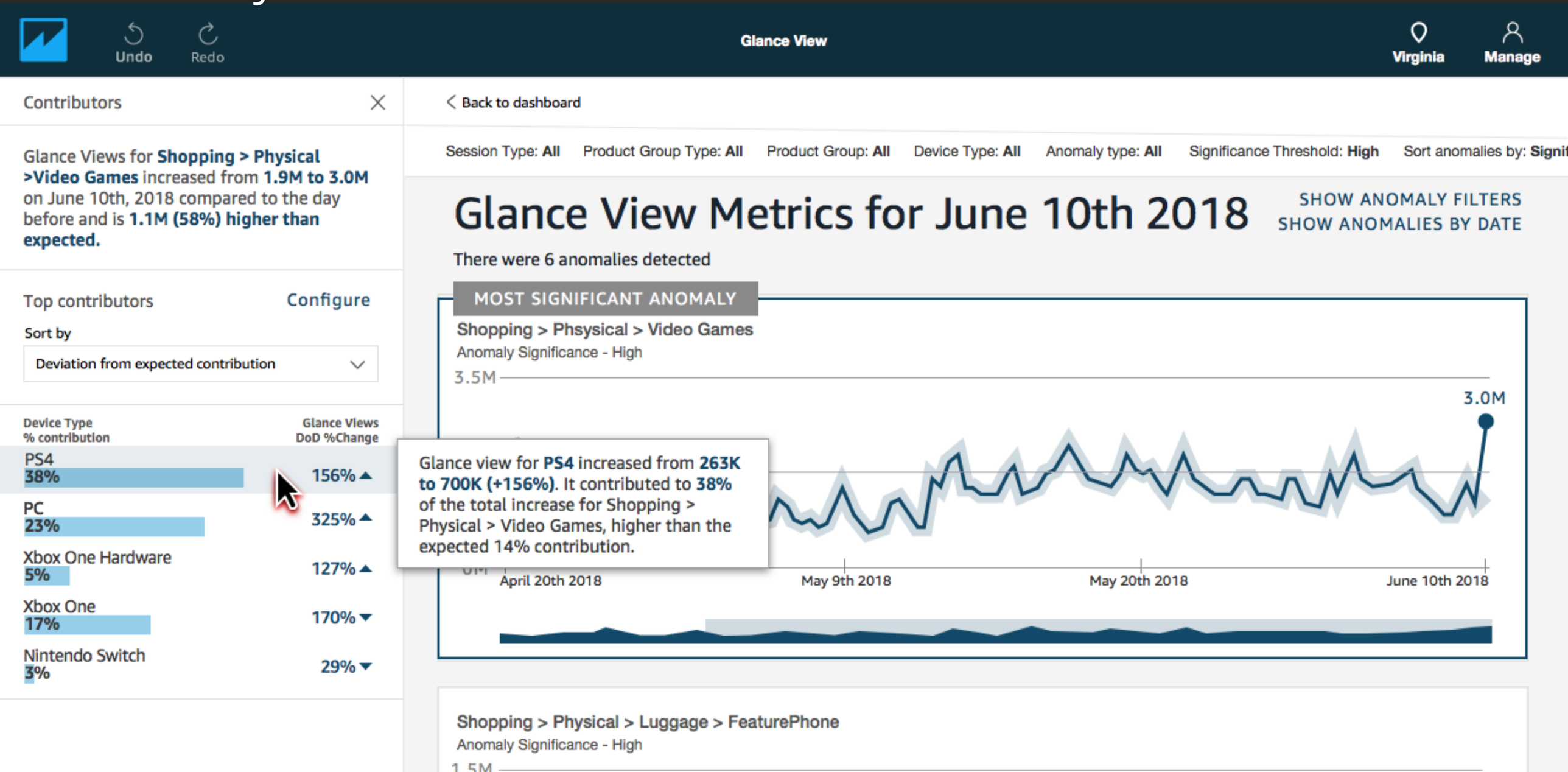
3. **Auto-narratives** to help customers tell the story of their dashboard in a plain-language narrative



Anomaly detection



Anomaly detection



Anomaly detection pricing

Available for Enterprise edition only

Volume tier	$ per thousand metrics processed
First 1,000,000 metrics processed	$0.50
Next 9,000,000 metrics processed	$0.25
Next 90,000,000 metrics processed	$0.10
> 100,000,000 metrics processed	$0.05

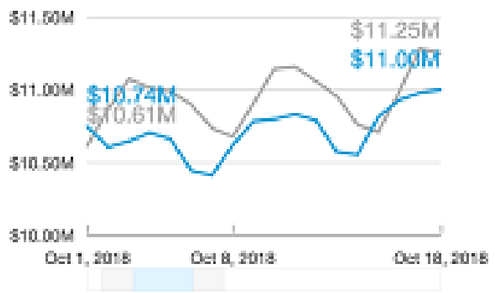
Forecasting



Natural language narratives

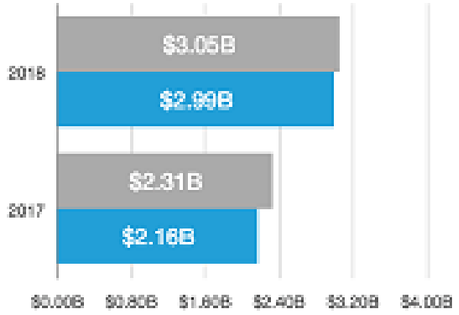
Daily Revenue

Daily revenue **decreased -0.51% (-$57,032.99)** on Nov 18, 2018, from $11.19M to $11.14M compared to the previous day and is **-1.78% (-$202,111.70) below** goal of $11.34M. We are **$2789.67K (0.334%) above** 30-day average revenue of $8.35M. We're operating at an **run rate of $4.06B.**



YTD Revenue

Year-to-date revenue **increased** by **61.95% ($1.14B)** from $1.85B to $2.99B compared to the same period last year and is **-1.81% ($55.03M) below** plan of $3.05B. We are at **98.19%** achievement of YTD goal and **84.61%** achievement for annual goal.

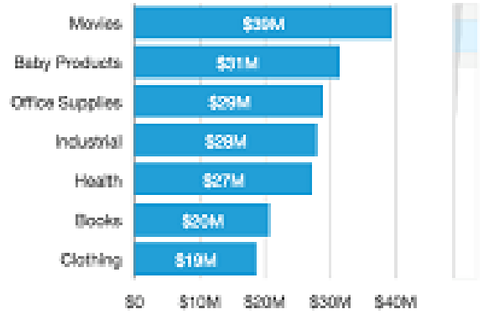


Callouts By Product and Country

Daily revenue for **Baby Products | Russia** on Nov 22, 2018 was **lower than expected** at $1,170.58.

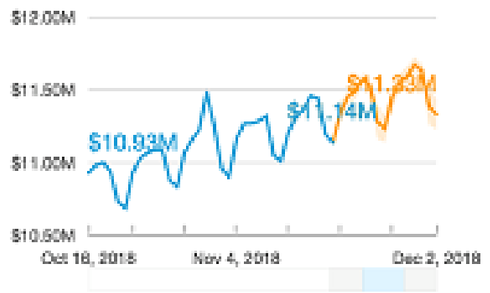
Callouts by Customers

Daily revenue for on Nov 22, 2018 was **higher than expected** at $60,433.95.



Daily Revenue Forecast

Daily revenue is predicted to reach **$11.96M** by end of the year. We expect to exit the year with an annualized run rate of **$4.37B**. Total revenue for 2018 is predicted to reach $3.47B, **$63.59M (-1.80%) below** annual target of $3.54B.



Top / Bottom Movers by Product

Top daily revenue increase by products are:

- Electronics increased by **$537.84 (7.61%)** from $7,066.98 to $7,604.82.
- Clothing increased by **$484.86 (0.06%)** from $769,561.89 to $770,046.75.
- Industrial increased by **$427.49 (0.04%)** from $1,078,710.02 to $1,079,137.51.
- Home Services increased by **$114.68 (0.21%)** from $55,338.04 to $55,452.72.
- Music increased by **$87.40 (0.67%)** from $12,997.83 to $13,085.23.

Top / Bottom to Plan Variance by Product

Top products above plan for today are:

- Movies is **$147,437.42 above goal.**
- Financial Services is **$98,111.46 above goal.**
- Clothing is **$42,220.37 above goal.**
- Computers is **$38,003.06 above goal.**
- Outdoors is **$27,404.67 above goal.**

Top products below plan for today are:

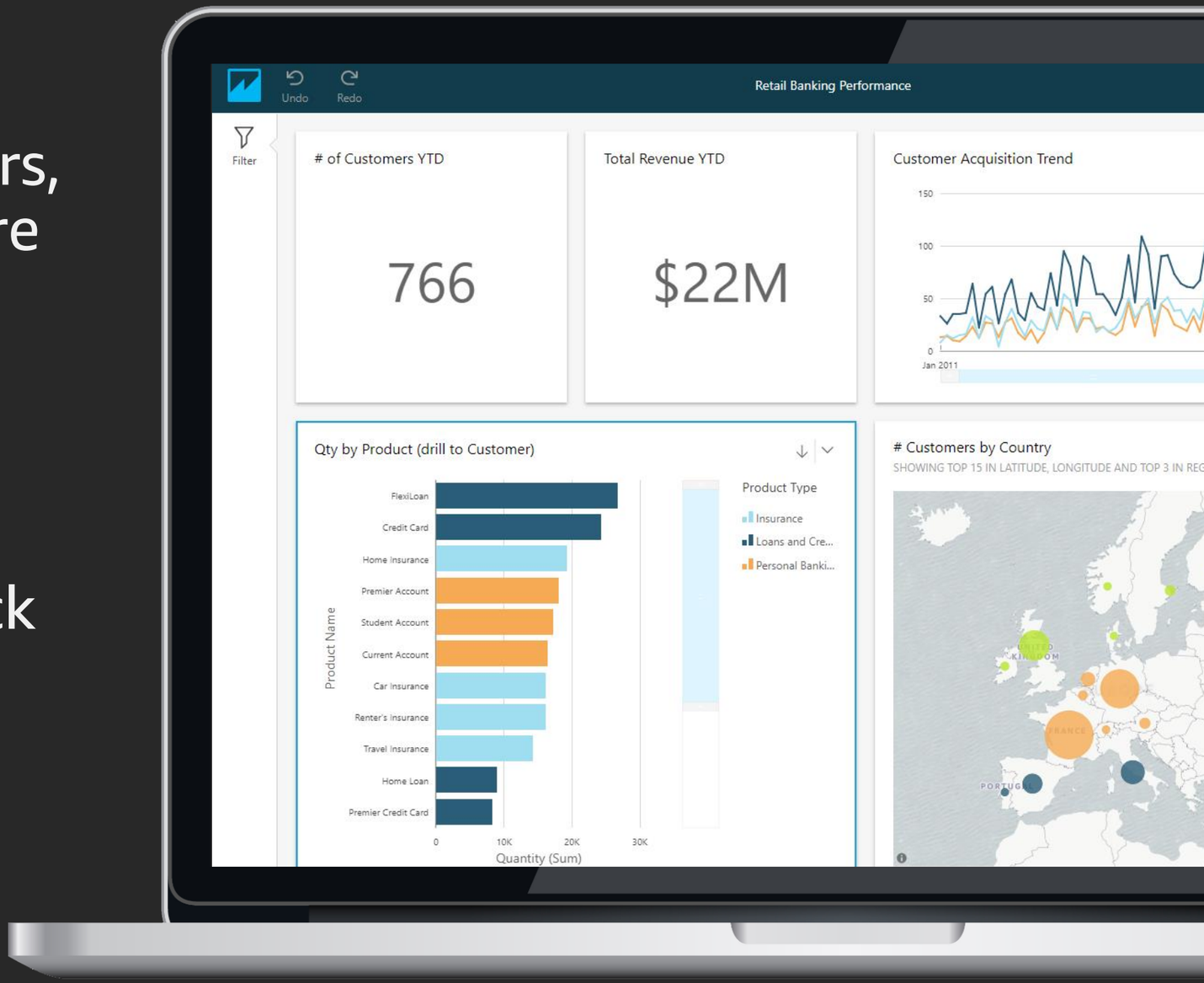
- Digital is **-$236,951.70 below goal.**
- Health is **-$147,634.66 below goal.**

Revenue by Product Category

Product Ca...	Nov 18, 2018 Revenue	Nov 17, 2018 Revenue	N
Arts	$4,988.40	$4,988.18	
Automotive	$52,309.00	$52,488.34	
Baby Product	$1,354,243.11	$1,368,901.33	
Beauty	$8,114.71	$8,116.06	
Books	$1,330,700.80	$1,331,300.71	
Business	$38,736.02	$41,916.59	
Clothing	$770,046.75	$769,561.89	
Collectibles	$709.44	$803.63	
Computers	$539,996.53	$540,576.75	

Create beautiful, interactive dashboards

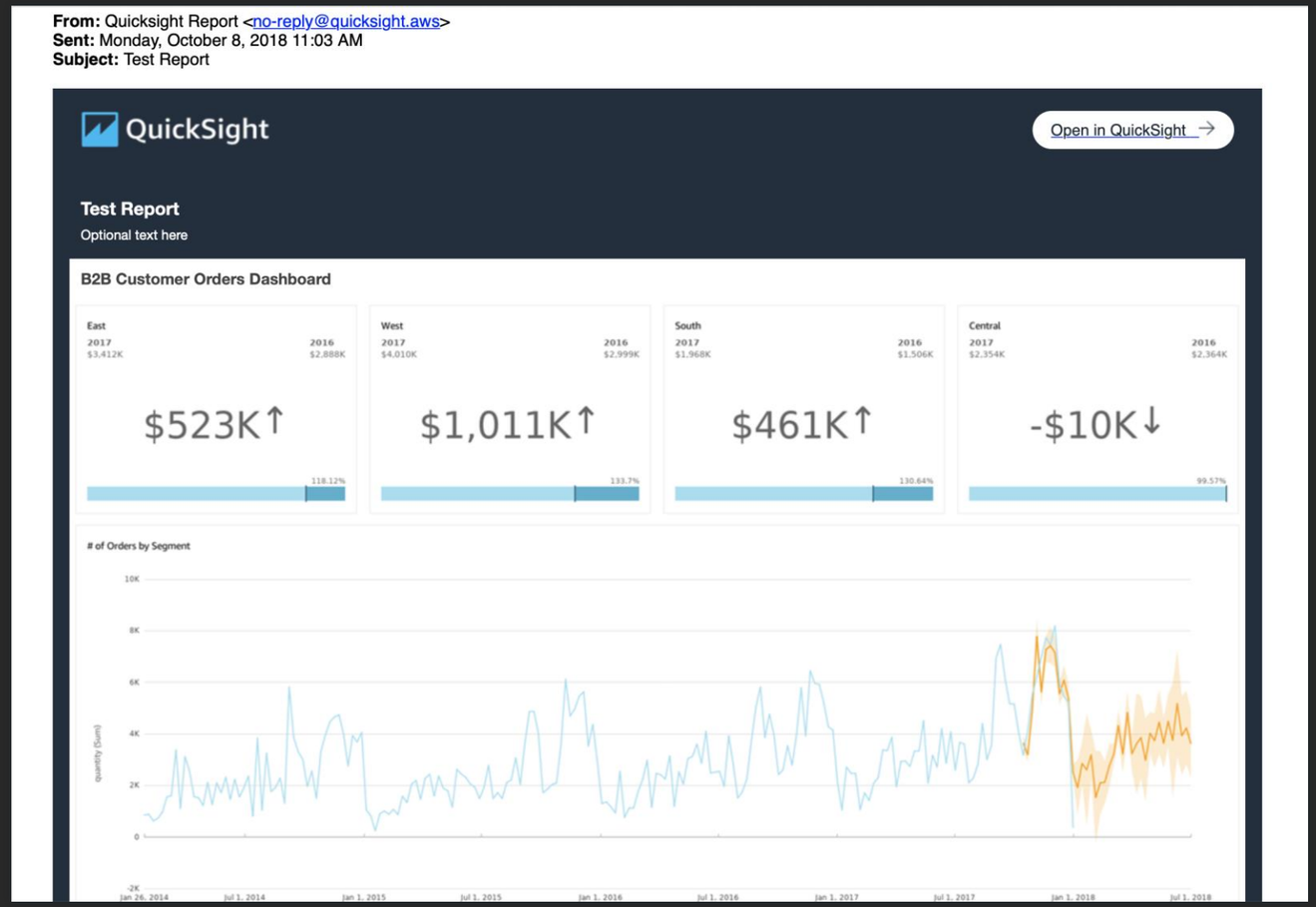
- Add rich interactivity, like filters, drill downs, zooming, and more
- Blazing-fast navigation
- Accessible on any device
- Data refresh
- Publish to everyone with a click



Insights delivered to your inbox

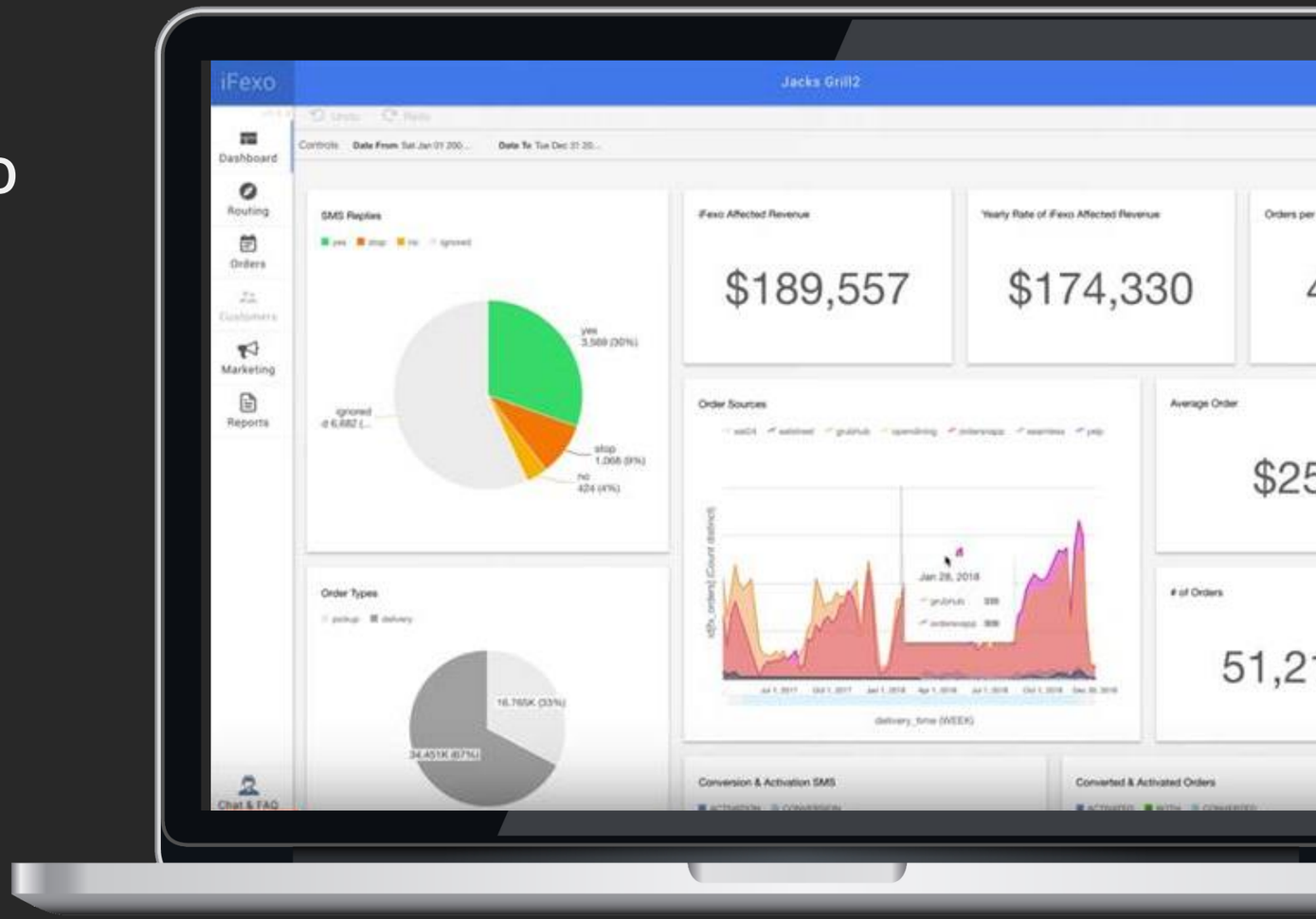
Amazon QuickSight lets you send report snapshots directly to your users' inbox

- Schedule email reports on a daily, weekly, or monthly basis
- Sent to individual users or groups
- Users can opt out of any report so they can focus on what’s important
- • Uses pay-per-session pricing



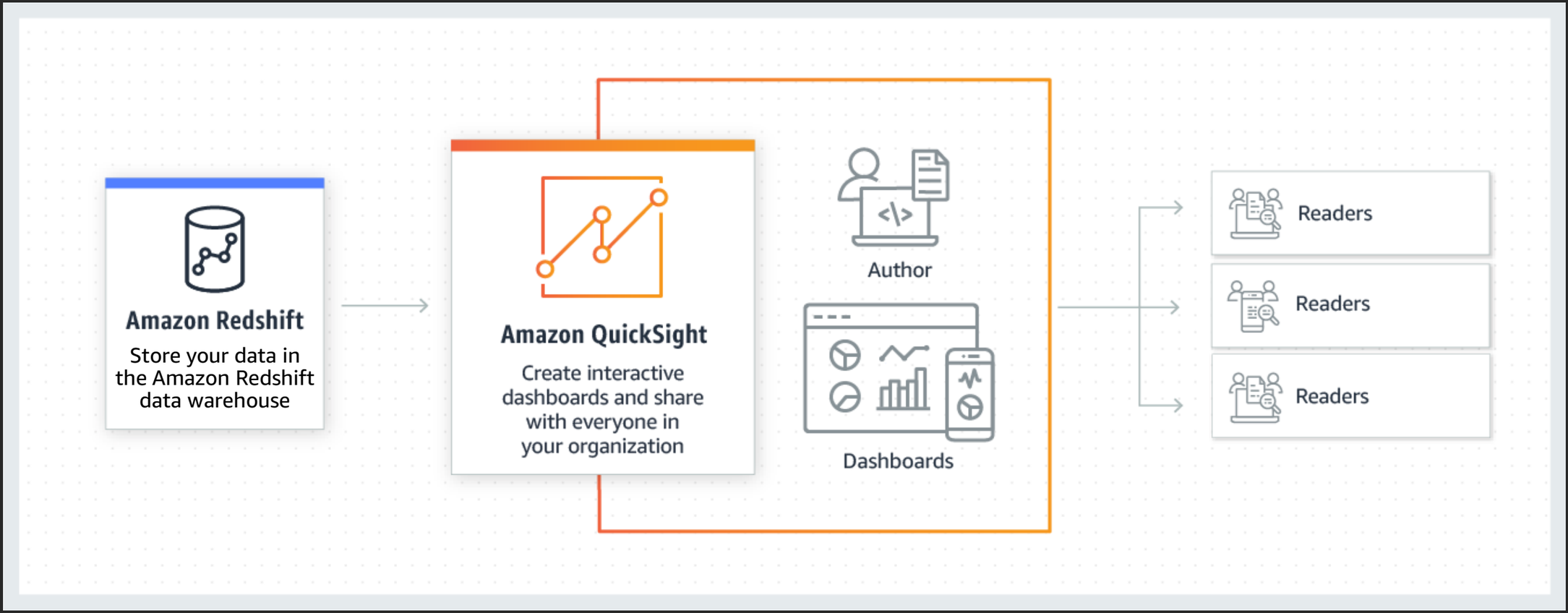
Embedding dashboards in your application

- Enhance your applications with rich analytics and dashboards
- Easy maintenance; no servers to manage
- Fast! No custom development or domain expertise needed
- Leverage new features as we add them
- Utilizes pay-per-session pricing



How Amazon QuickSight works

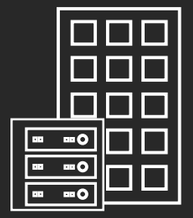
Amazon QuickSight allows you to connect to your data sources and create dashboards that can be securely shared across your organization



Connect to your data, wherever it is

Amazon QuickSight is natively integrated with AWS data sources, as well as on-premises and hosted databases and third-party business applications

On-premises



Securely connect to on-premises databases and flat files like Excel and CSV

- Excel
- CSV
- Teradata
- MySQL
- SQL Server
- PostgreSQL

In the cloud



Connect to hosted database, big data formats, and secure VPCs

- Amazon Redshift
- Amazon RDS
- Amazon S3
- Amazon Athena
- Amazon Aurora
- Teradata
- MySQL
- Presto
- Spark
- SQL Server
- PostgreSQL
- MariaDB
- Snowflake
- AWS IoT Analytics

Applications

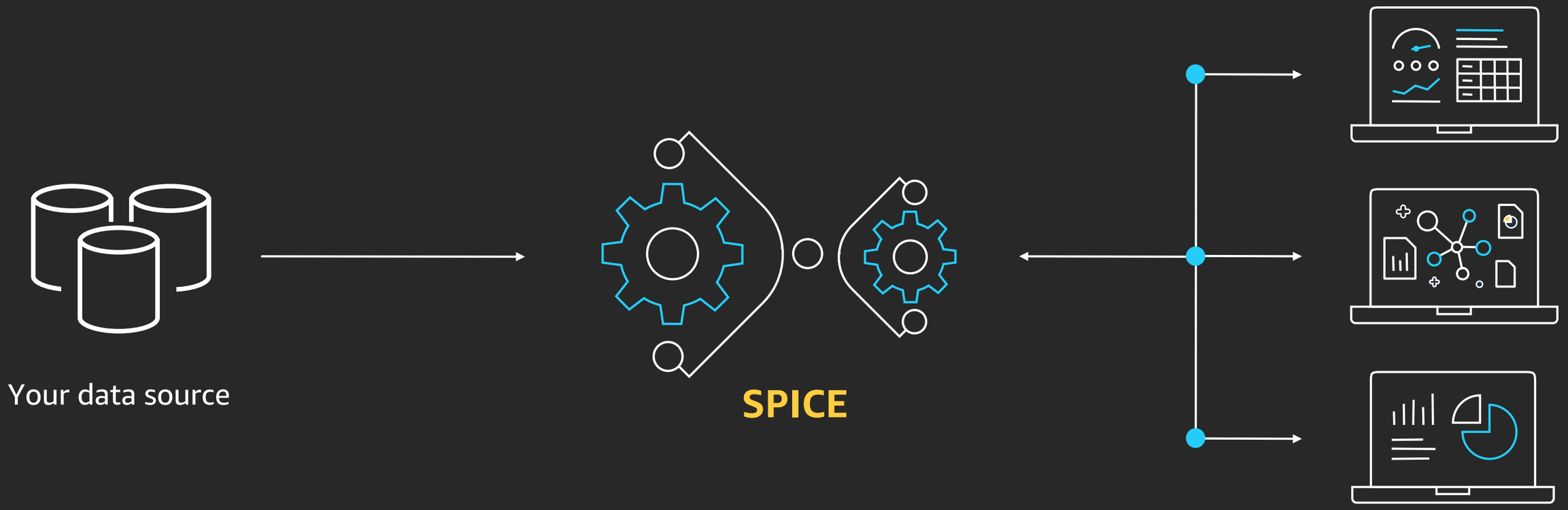


Connect directly to third-party business applications

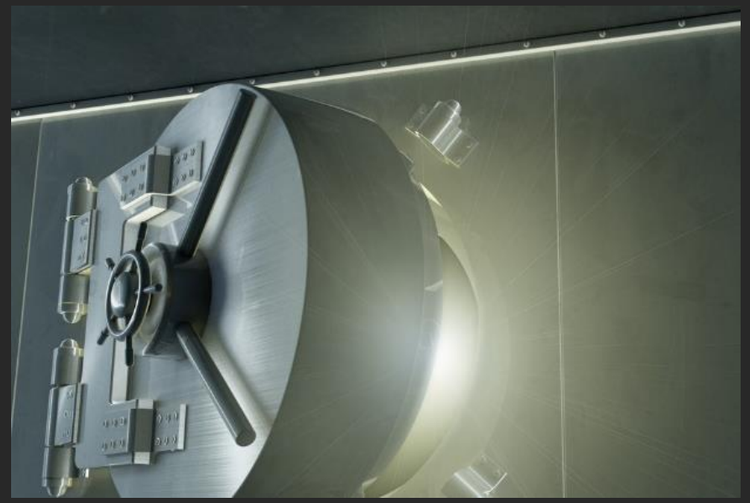
- Salesforce
- Square
- Adobe Analytics
- Jira
- ServiceNow
- Twitter
- Github

SPICE

Amazon QuickSight is powered by SPICE, a super-fast calculation engine that delivers performance and scale, regardless of how many users are active



Built enterprise-ready



Secure and compliant

- End-to-end encryption
- HIPAA
- SOC 2
- PCI
- ISO 27001
- FedRAMP



Global availability

Enable collaboration across global teams, with local SPICE storage for optimized access

- N. Virginia
- Oregon
- Ohio
- Dublin
- Frankfurt
- Japan
- Singapore
- Sydney
- London



Built-in redundancy

Native high-availability (Multi-AZ) and fault tolerance with transparent data replication and backups

Enterprise edition

For deploying insights at scale, across your organization

Authors



Create and publish interactive dashboards

$18

/user/month

Billed annually

$24/user/mo. paying month to month

Readers



Secure access to dashboards anytime, anywhere

$0.30 /session*

up to a max of

$5 /user/month

*session = 30 mins. From login

Standard vs Enterprise

	Standard edition	Enterprise edition
All capabilities of Standard edition plus…	√	√
Reader role		√
Email reports		√
Securely access data in private VPCs and on-prem		√
Row-level security		√
Hourly refresh of SPICE data		√
Secure data encryption at rest		√
Connect to active directory		√
Use active directory groups		√
APIs NEW!		√
Dashboard embedding NEW!		√
ML Insights NEW!		√

AWS Directory Service for Microsoft Active Directory

Custom date format

Dashboard save as

Anomaly detection alerts

Readers

Groups

Private VPC

100M-row SPICE tables

Spark and Presto Connector

Scheduled refresh

Just-in-time provisioning

London & Frankfurt Regions

Search

Totals

Excel custom range

Federated SSO

Athena connector

200+

Export to CSV

Amazon S3 Analytics

Week aggregation

Aurora PostgreSQL

new features released since launch

Calculations in SPICE

Cross-account S3 access

Row-level security

Hourly refresh

Conditional formatting

Sydney & Tokyo Regions

10K Filter Values

ML Insights

KPI chart

Spark Connector

Amazon Redshift Spectrum support

URL actions

AD Connector

Tabular reports

Singapore Region

Filter actions

Combo charts

Embedded dashboards

Geospatial maps

Level-aware aggregations

Parameters

Relative date filters

Filter groups

Other buckets

Snowflake Connector

SaaS Connectors

Teradata Connector

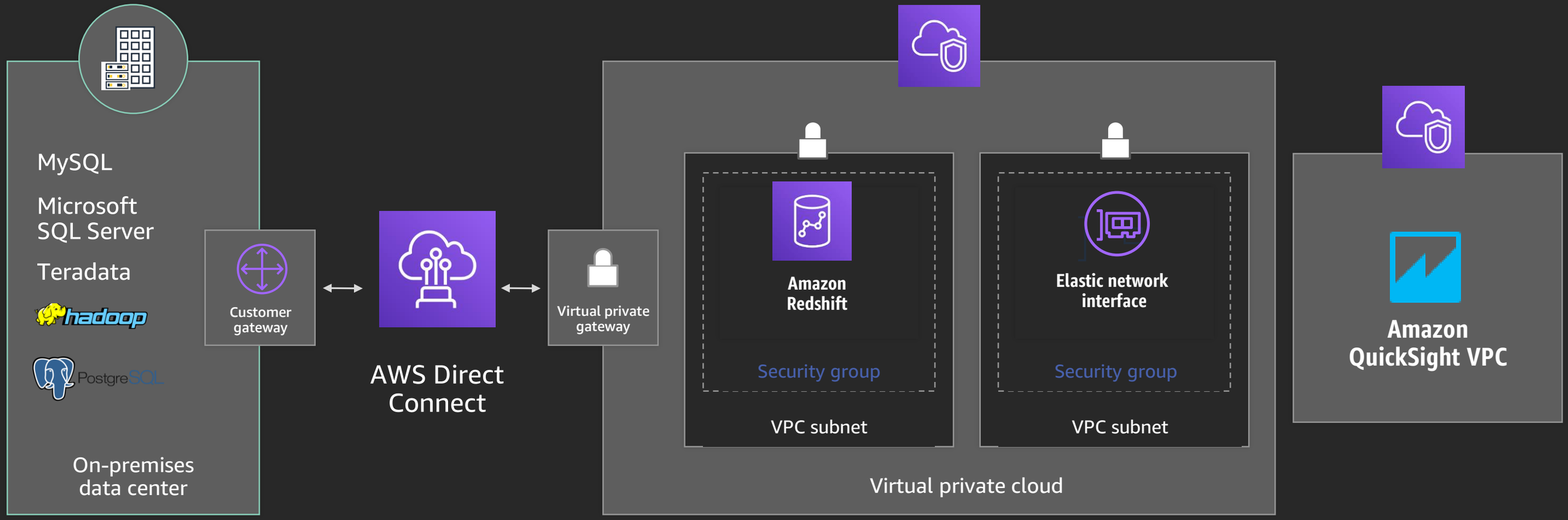
HIPAA

PCI compliance

What's new (since June 2019)

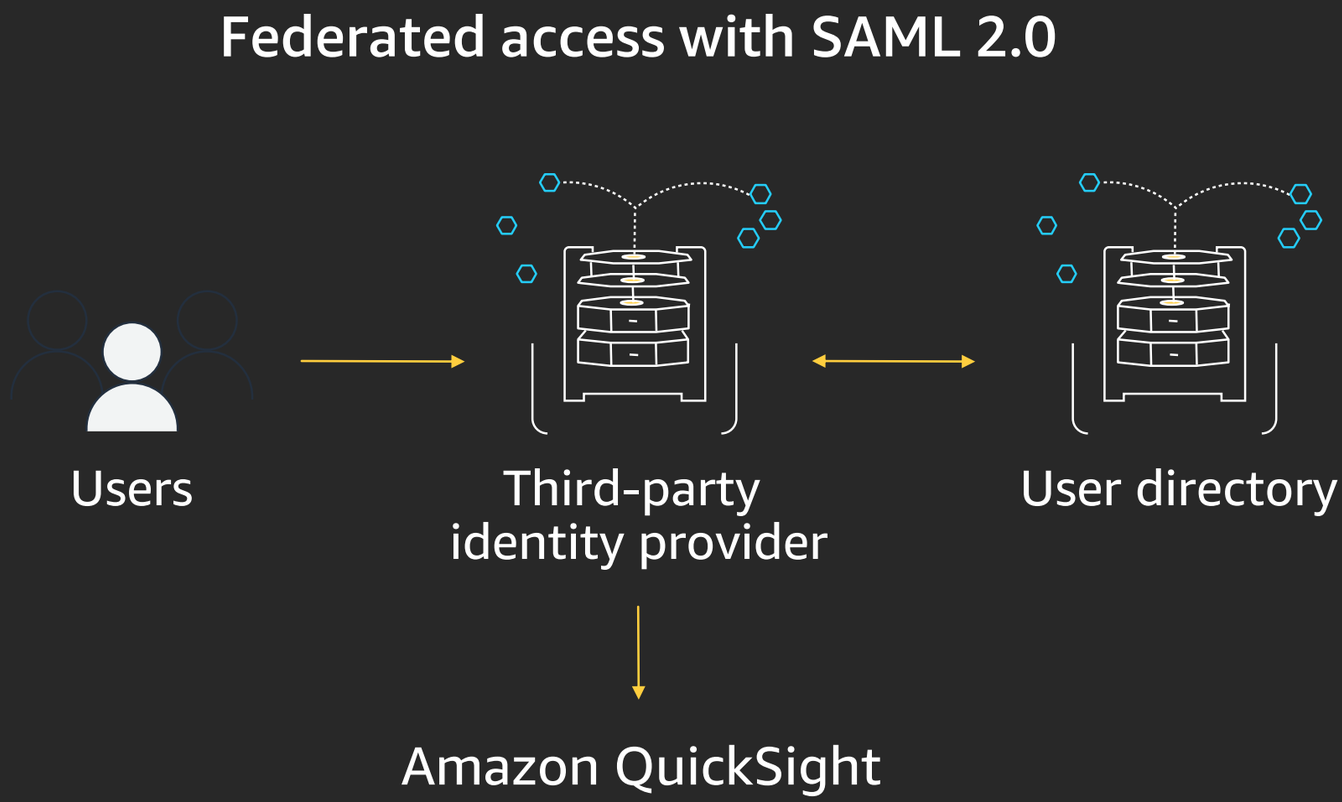
- **Amazon SageMaker integration**
- **ML Insights (forecasting, anomaly detection, natural language narratives)**
- **100M rows in SPICE**
- **Cross-source joins**
- **Conditional formatting**
- Cross-region VPC peering
- VPC gateway for external data sources
- Level-aware aggregations
- APIs: Data set refresh/status
- APIs: Dashboard
- APIs: Theming
- APIs: User management
- Multiple sheets (tabs)
- Regional AD support
- JSON support
- Donut, Gauge, Word Cloud charts
- **Dashboard embedding**
- **Group-based row-level security**
- **Amazon S3 scope-down policies**
- **Localization (9 languages)**
- **Regions: London, Frankfurt, Seoul**
- **New iOS and Android apps**
- Filter actions
- Printing
- Themes
- Transpose tables
- Percentile, StdDev, Var
- Duplicate visual
- Replace data set
- Hide columns in tables
- Favorites
- Anomaly detection alerts

Securely connect to on-premises data



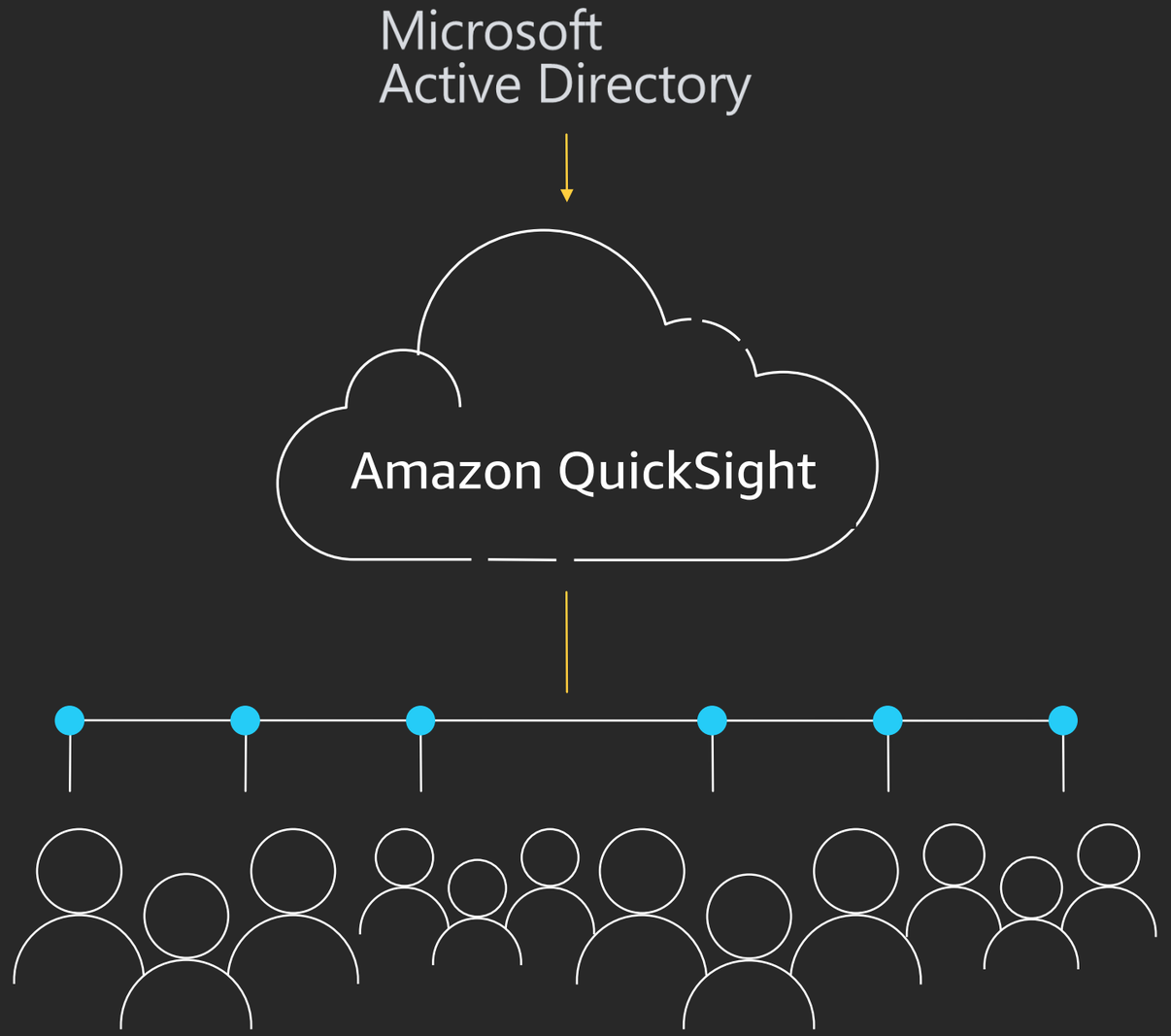
Federated single sign-on (SSO)

Allows users to sign into their identity provider portals with existing credentials, then access Amazon QuickSight using SAML 2.0



User management and AD integration

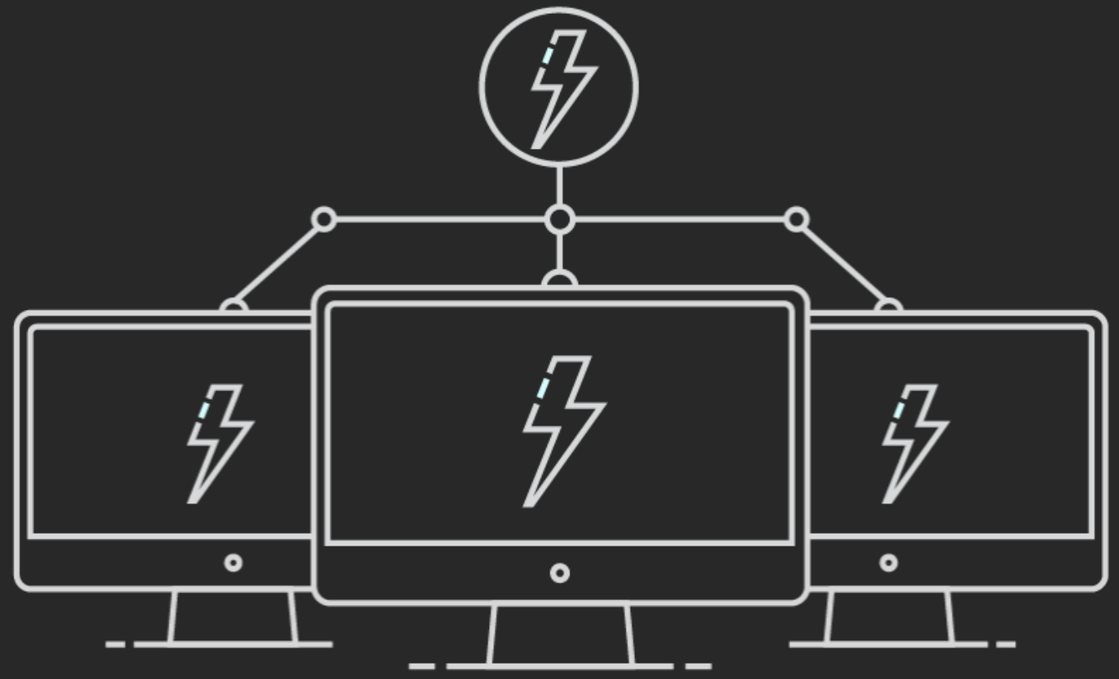
Amazon QuickSight Enterprise edition can integrate with your Active Directory to dynamically manage users and groups



Secure content management

As a hosted application, everything you create in Amazon QuickSight is always connected and always under control

- Modify, delete, refresh, and manage user access to everything
- Named user access with security permissions
- Track and manage all your content and easily see who has access to what

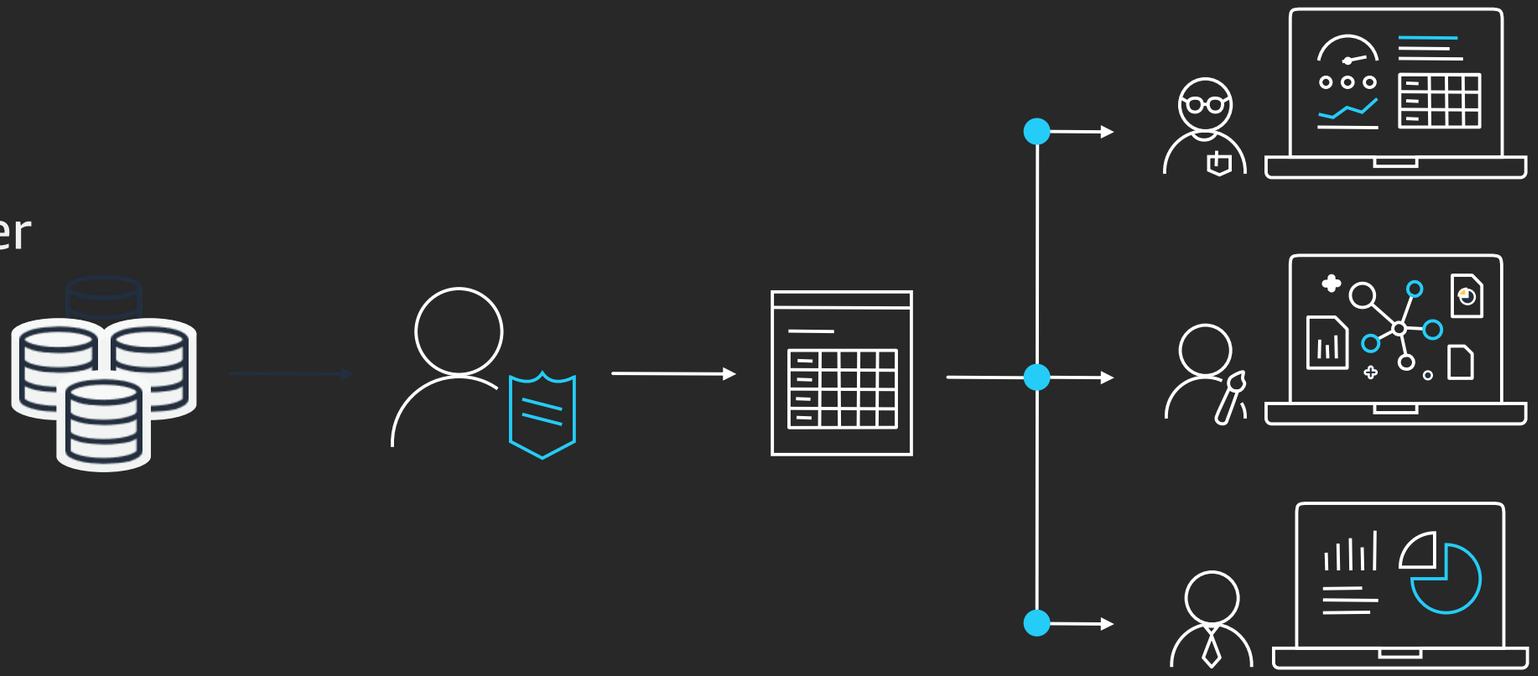


Data governance

Create managed datasets that give power users and authors the flexibility to perform self-serve analytics on data that you control

Create datasets that:

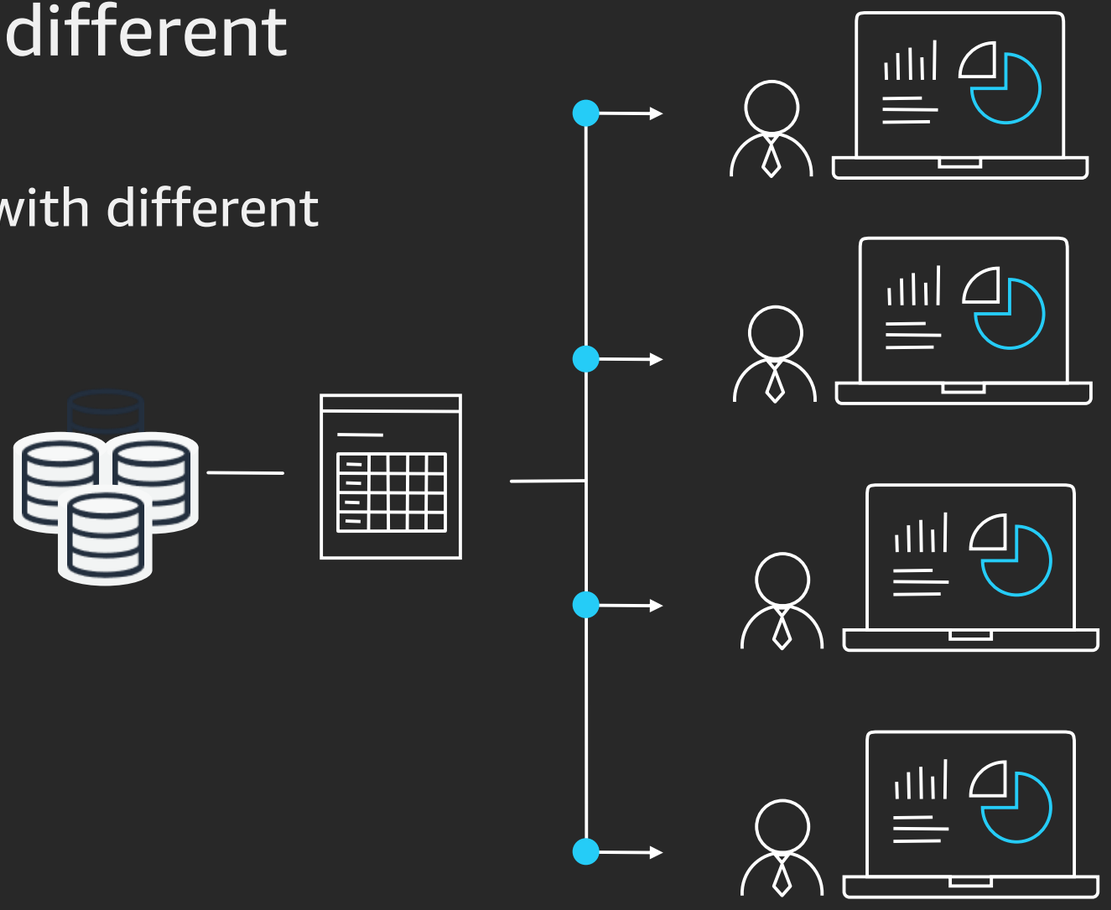
- Can be shared with any user
- Automatically refresh
- Have row-level security
- Users cannot modify
- Dynamically update with changes



Row-level security

Row-level security allows you to create dashboards and reports that display different data for different users

- Create a single dashboard for multiple users with different roles or data access
- Centrally govern access at the dataset level
- Works with email reports

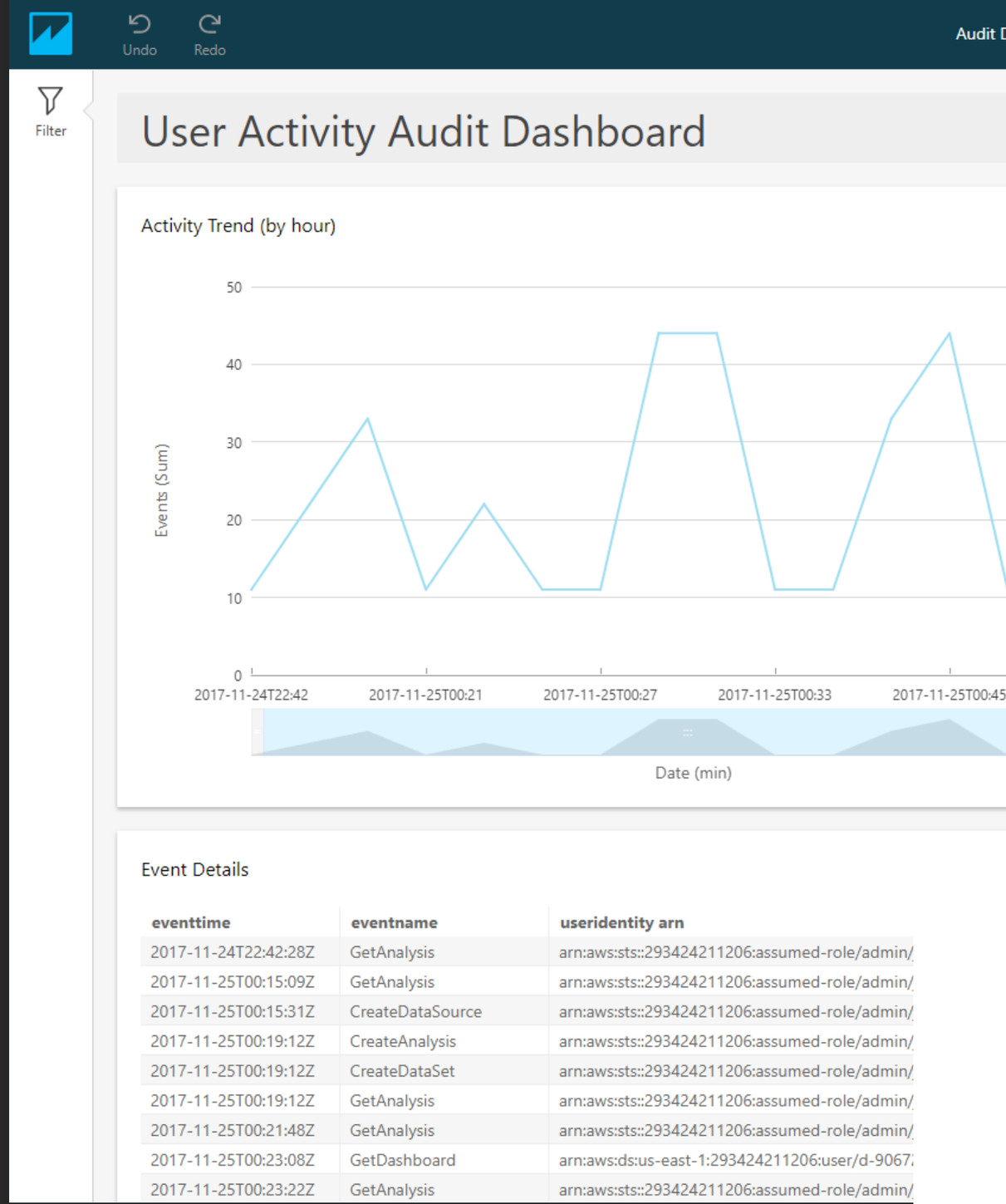


Auditing & logging

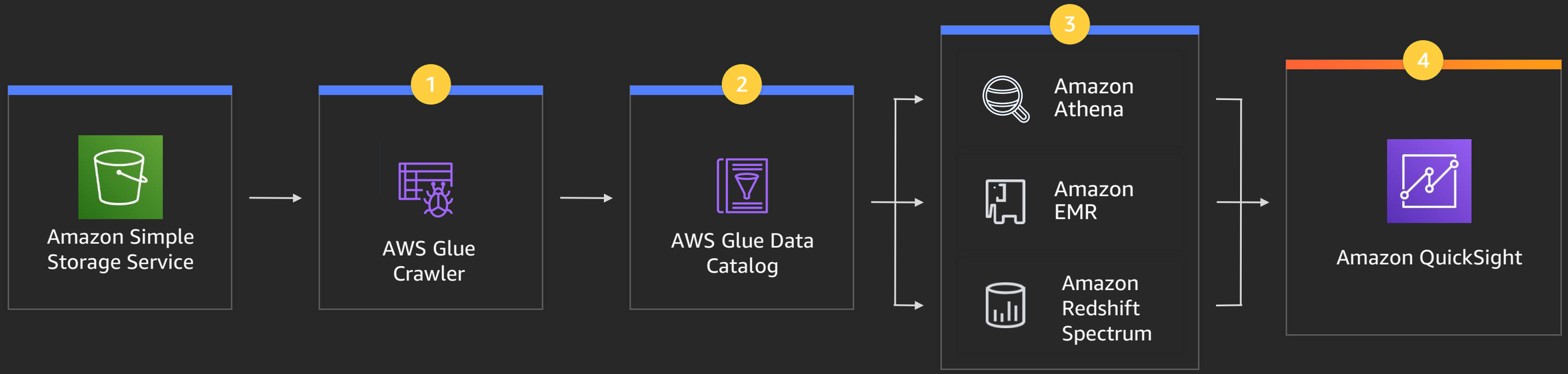
Keep track of your account with AWS CloudTrail for governance, compliance, and auditing purposes

Answer questions such as:

- How many users have seen this dashboard?
- Which dashboards has this user seen?
- Who has created a new dataset?
- When did they create the new dataset?



Serverless data lake & analytics with AWS



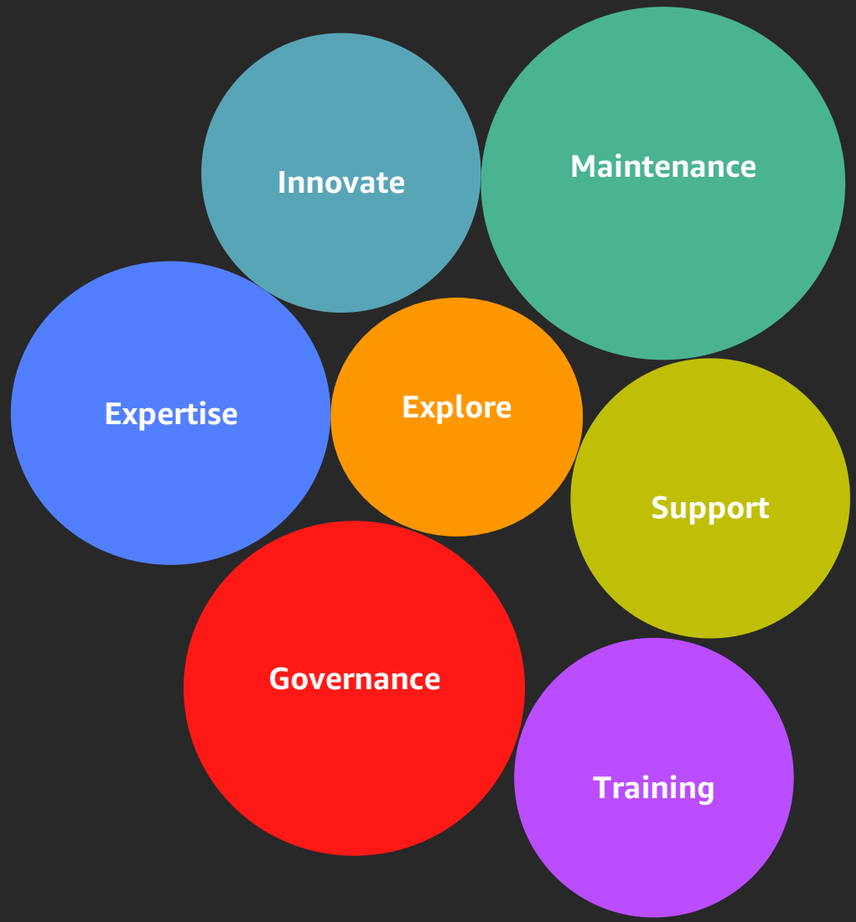
1. Crawlers scan your datasets and populate the AWS Glue Data Catalog
2. The AWS Glue Data Catalog serves as a central metadata repository
3. Once catalogued in AWS Glue, your data is immediately available for analytics
4. Visualize with Amazon QuickSight

https://github.com/aws-samples/serverless-data-analytics

Enterprise business analytics

Enterprise BI team within Capital One is responsible for managing and supporting various BI tools

- Supporting BI community of about 25K users
- From executives to call center agents
- Comprises traditional and self-service BI
- From analytical dashboards to operational reports
- BI governance & center of excellence



Key BI use cases

Our business teams leverage BI tools for a variety of use cases, and we see Amazon QuickSight as a fit for most of those



Performance analysis & forecasting



Spend & risk analysis



Market research



Monitoring & governance



Fraud & anomaly detection



Operational reporting

Uniqueness of Amazon QuickSight

Our team constantly evaluates BI products in the market and finds the best that meets all our requirements and offers enriched capabilities

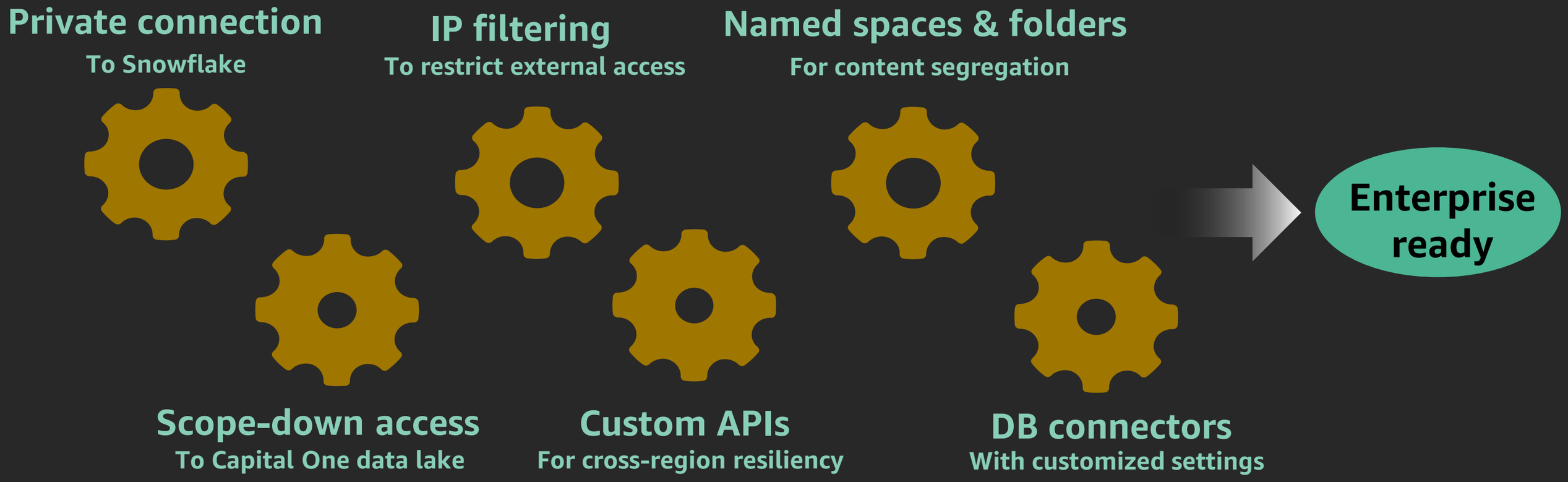
- Relief from server rehydration & downtime
- Say no to traditional long software upgrade cycle
- Expand without the need for capacity assessment
- No software license commitment
- No need for dedicated platform support
- More secured embedded analytics
- Power of machine learning
- Pay for what you use



“Next-generation BI”

Tailored engineering solution

We had unique implementation requirements. Amazon QuickSight team was able to deliver that with quick turnaround, meeting our standards.



Customer engagement

Customer engagement and support determines the success of any product or service. We have the flexibility of collaborating with the Amazon QuickSight team in several ways.

- Expert sessions
- On-demand trainings
- Early access to beta features
- Enhancement prioritization
- Engineering consultation
- Design review sessions
- 24/7 support



“Prime care” at no extra cost

Related breakouts

ANT217 – Embedded analytics into applications with Amazon QuickSight

ANT302 – Enhancing your applications with Amazon QuickSight dashboards

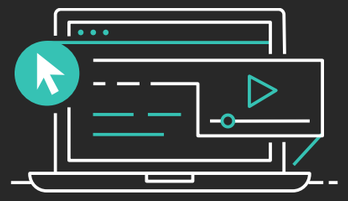
ANT341 – Integrating Amazon SageMaker and Amazon QuickSight

ANT211 – Developing with the Amazon QuickSight SDK

ANT216 – ML analytics with Amazon QuickSight

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