



NOV. 28 – DEC. 2, 2022 | LAS VEGAS, NV

2022 re:Invent re:Cap – 1000 Hours in 60 Minutes

Content Provided by Services Teams and compiled by Solutions
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Compute

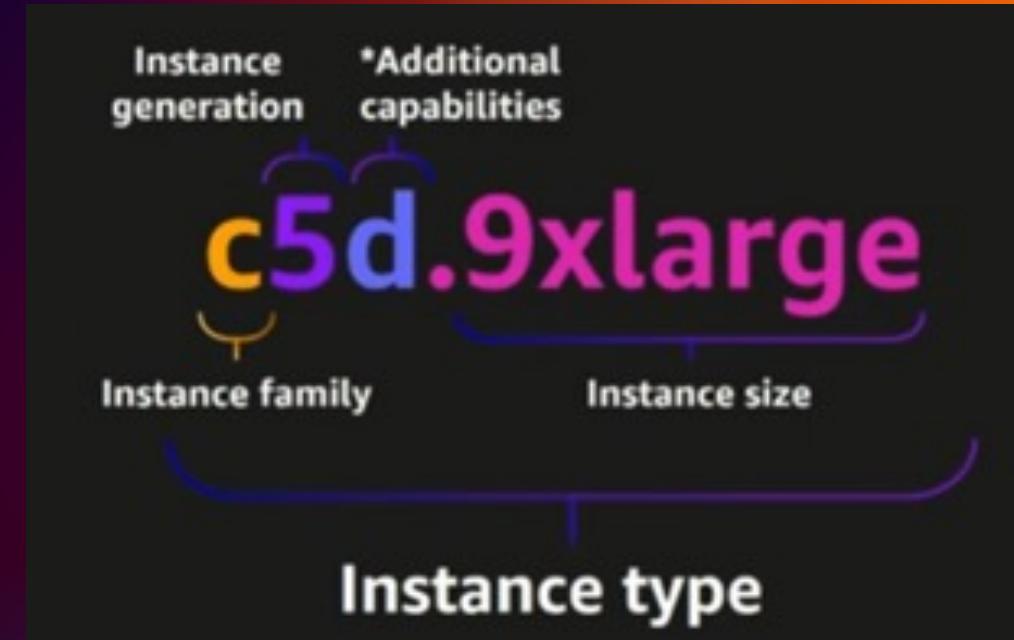


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Quick Reminders on EC2 Naming

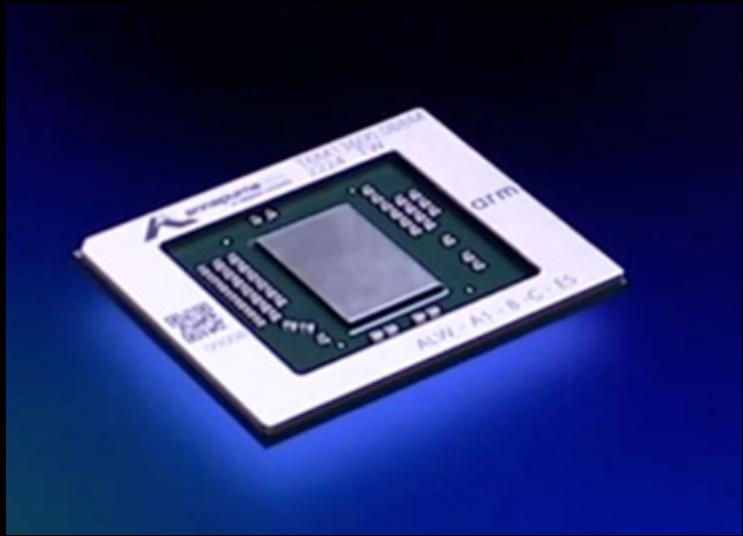
Examples of EC2 Names

General Purpose	Compute Optimised	Memory Optimised	Accelerated Computing	Storage Optimised
 A1 ARM based core and custom silicon	 C4 Compute - CPU intensive apps and DBs	 R4 RAM - Memory intensive apps and DB's	 P2 Processing optimised - Machine Learning	 H1 High Disk Throughput - Big data clusters
 T2 Tiny - Web servers and small DBs		 X1 Xtreme RAM - For SAP/Spark	 G3 Graphics Intensive - Video and streaming	 I3 IOPS - NoSQL DBs
 M4 Main - App servers and general purpose		 z1d High Compute and High Memory - Gaming	 F1 Field Programmable - Hardware acceleration	 D2 Dense Storage - Data Warehousing



AWS Nitro v5

LATEST GENERATION OF VIRTUALIZATION ACCELERATION HARDWARE



Nitro v5 Custom Silicon by Annapurna Labs

2x

Transistors

50%

Faster DRAM
Speed

2x

More PCIe
Bandwidth

60%

Higher PPS

30%

Lower Latency

40%

Better Performance
per Watt

Enabling the next generation of AWS EC2 Instances and Performance

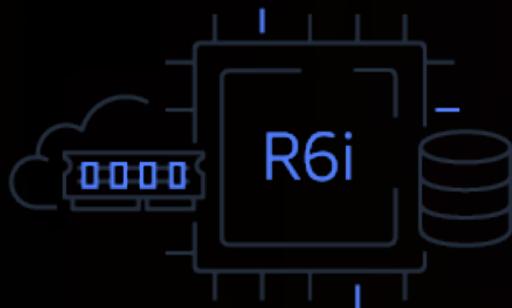
AWS EC2 M6in, M6idn, R6in, R6idn, C6in

UPGRADES PROVIDING NEW CHIPS AND MORE BANDWIDTH FOR NETWORK HEAVY WORKLOADS

Up to 33% larger
than M5n



Up to 33% larger
than R5n



9% more memory
bandwidth than C5n



Features 3rd generation Intel Xeon Scalable processors

2x network bandwidth and packet processing performance

Additional Features

- 3.5 GHz all-core turbo
- 80 Gbps EBS Bandwidth, up to 350K IOPS
- 2X larger networking, up to 200 Gbps
- 32xl instance allows for Elastic Fabric Adapter (EFA)
- Runs on the Nitro System

Why do I care? Money and Bandwidth

Check to see if you are using a larger instance than needed to get more network or EBS bandwidth. Check C6i, R5n, R5dn, M5dn, M5n.

AWS EC2 C7gn, Hpc7g, R7iz

NEXT-GENERATION INSTANCES FOR BOTH NETWORK INTENSIVE COMPUTE APPLICATIONS

C7gn

- AWS Graviton3E
- Up to 64 vCPU, 128 GiB memory, 200 Gbps
- 50% higher packet processing performance
- Check existing C6gn
- In preview **today**

Hpc7g

- AWS Graviton3E
- Up to 64 vCPU, 128 GiB memory, 200 Gbps
- 50% higher packet processing performance
- Coming in **early 2023**

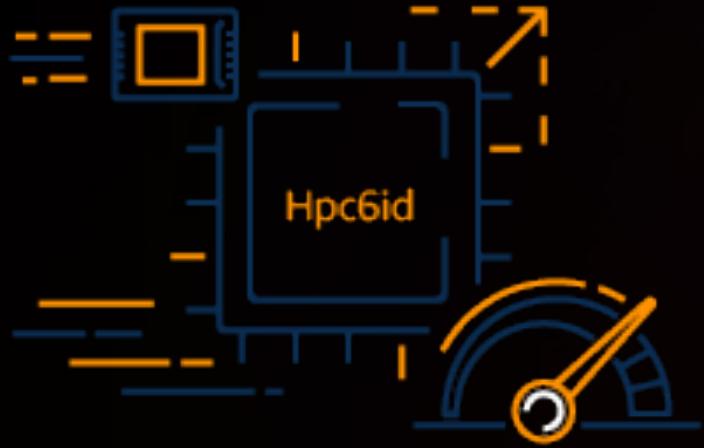
R7iz

- 4th gen Intel Xeon Scalable
- All-core turbo 3.9 GHz up to 128 vCPU and 1 TiB memory
- 200 Gbps network bandwidth
- 50% higher packet processing performance
- In preview **today**



AWS EC2 Hpc6id

UPGRADE FOR HIGH-PERFORMANCE MEMORY WITH MORE BANDWIDTH FOR NETWORK INTENSE WORKLOADS



Why do I care? Savings for HPC Workloads
Same workloads on fewer instances with fewer licenses.

Features 3rd generation Intel Xeon Scalable processors

Elastic Fabric Adapter (EFA) for 200 Gbps inter-node bandwidth

3x memory compared to Hpc6a

Additional Features

- 3.5 GHz all-core turbo, 64 vCPU, 1 TiB memory
- 15.2 TB local NVMe SSD
- Elastic Fabric Adapter up to 200 Gbps
- Runs on the Nitro System

AWS EC2 Inf2 – Inference Focused Instance

NEWEST GENERATION OF INFERENTIA POWERED INSTANCES FOR ACCELERATING DEEP LEARNING WORKLOADS

Why do I care? Money and Speed
No brainer upgrade for Inf1 instances.

3x

Compute
Performance

4x

Accelerator
Memory

4x

Higher
Throughput

10x

Lower
Latency

AWS Inferentia 2 accelerators

Up to 2.3 petaflops of compute and 384 GB memory

NeuronLink ultra-high-speed, nonblocking interconnect

Stochastic rounding and automatic casting

Additional Features

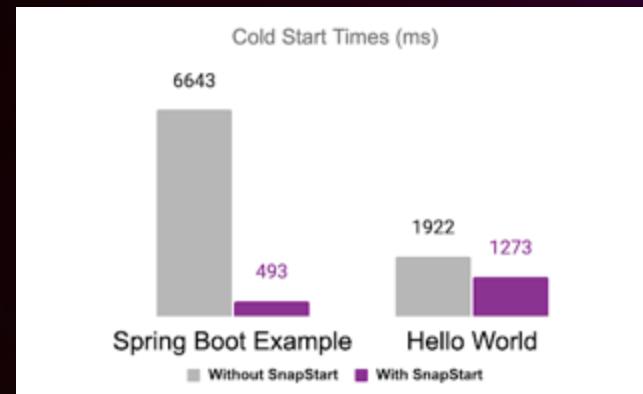
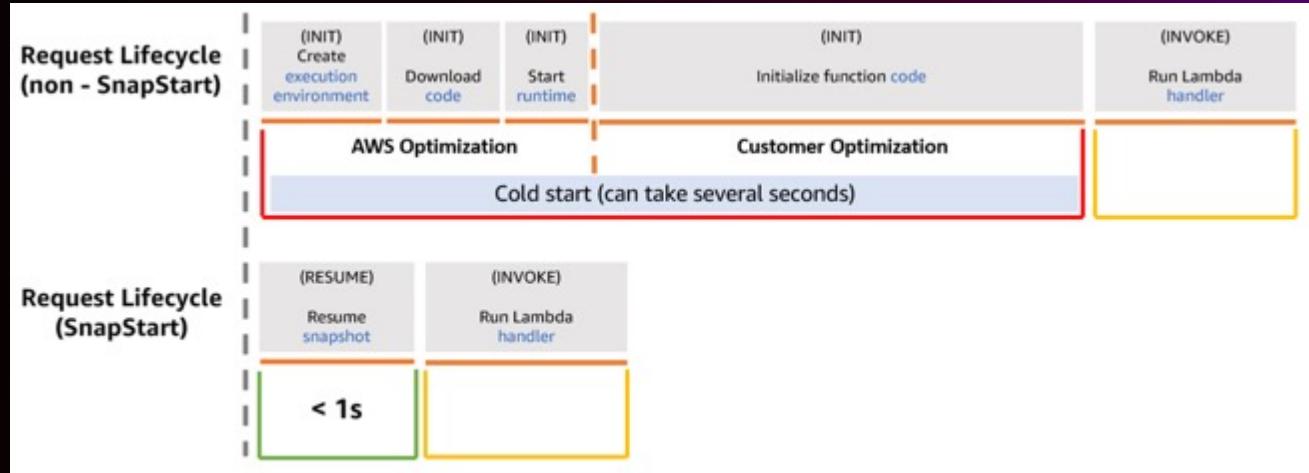
- Up to 192 vCPU and 768 GiB memory
- Up to 100Gbps network & 40 Gbps EBS
- Up to 175B parameter model per instance



AWS Lambda SnapStart for Java

A SNAPSHOT BASED MODEL MAKES NEW VERSIONS OF JAVA LAMBDA FUNCTIONS INITIALIZE VERY RAPIDLY

- Enable SnapStart and publish a new version
- Lambda initializes the function and takes a microVM snapshot and that snapshot is cached for low-latency access and used to create execution environments for function invocation
- Function start up time is now virtually identical between cold and warm invocations
- No additional cost and can reduce cost at scale!
- Only Amazon Corretto Java 11 runtime is supported right now, do not have any temp data (credentials) that would cause the snapshot data to be stale when invoked, and doesn't support X-Ray yet



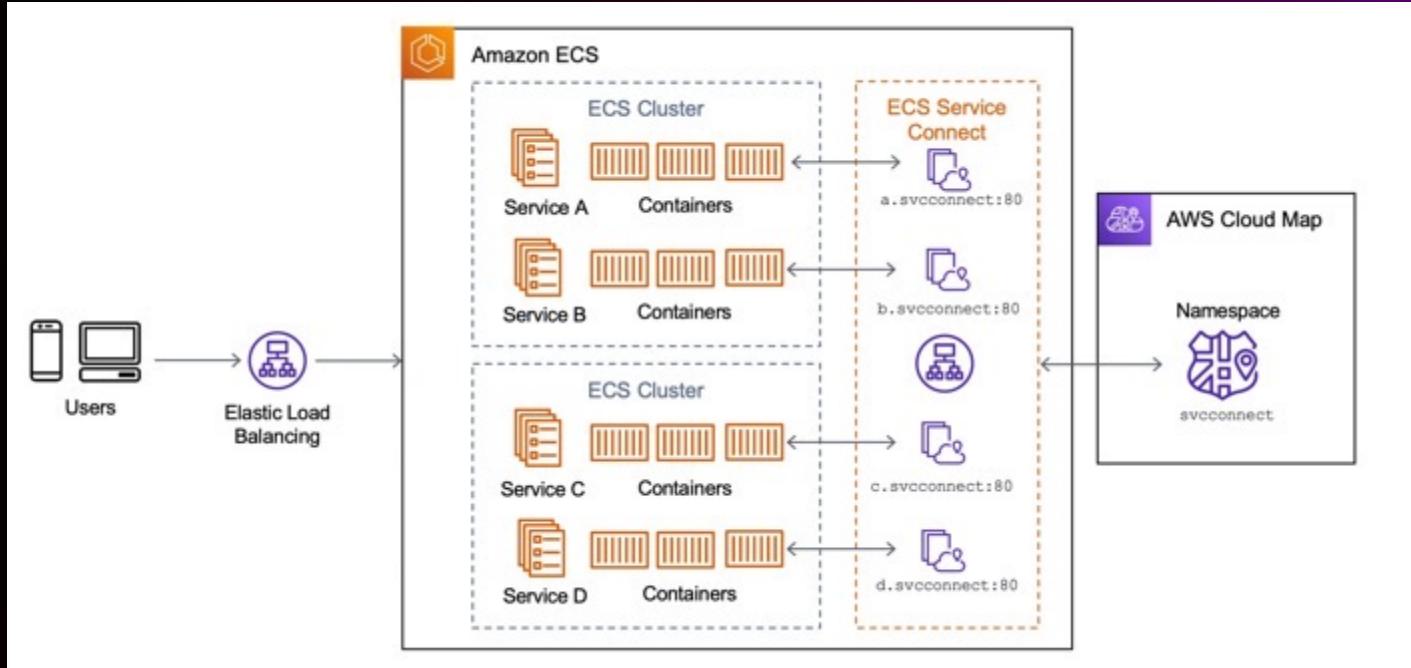
Example from Pulumi



Amazon ECS Service Connect

STREAMLINE SERVICE COMMUNICATION WITHIN AND ACROSS ECS CLUSTERS THROUGH CLOUD MAP

- Easily connect services across ECS clusters and VPCs using logical names
- No need to deploy and configure load balancers – cost savings!
- Add resilience and traffic insights to ECS service communication without code



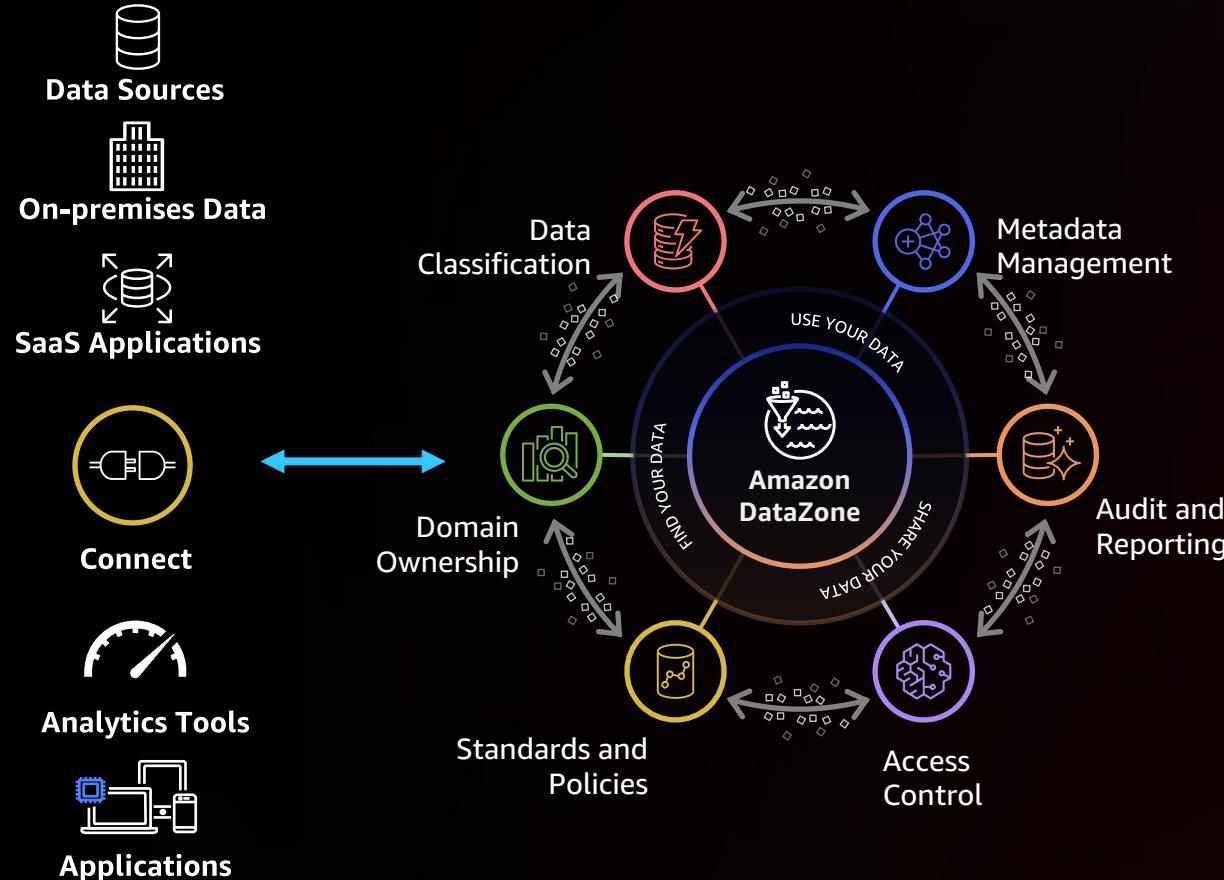
Database & Analytics



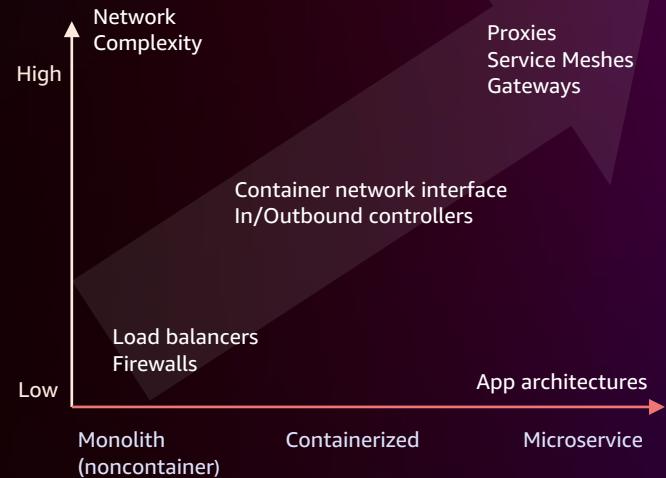
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“Mesh” is Coming for Data and Networking

A KEY COMPONENT THAT IS BEING DISCUSSED ACROSS OUR SERVICES IS A DATA MESH



Modern Applications and Network Complexity



Challenges of Modern Application Networking

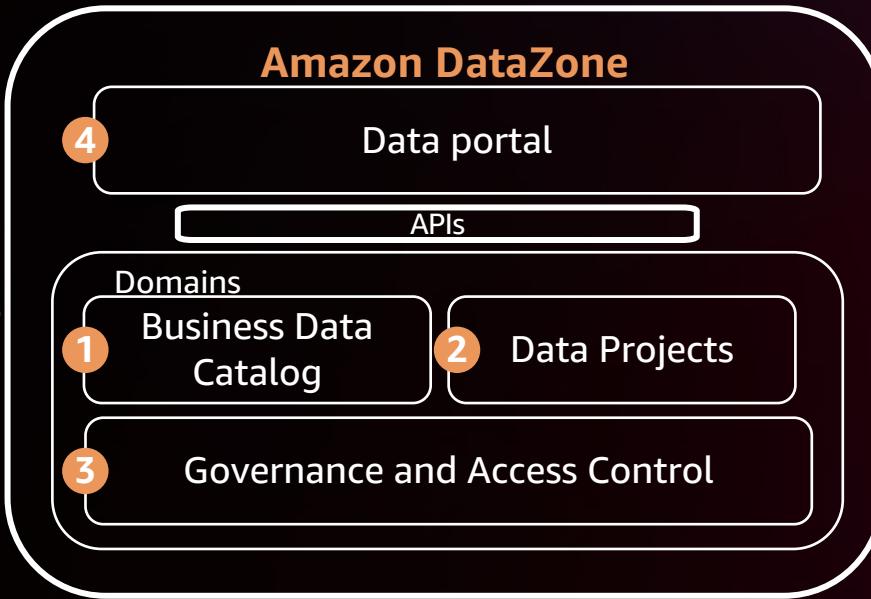
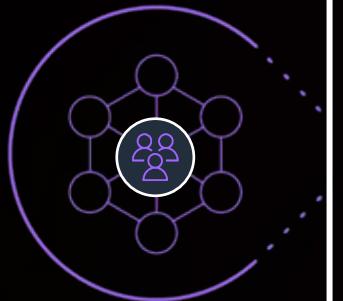
- Increasing network complexity at the application layer
- Developers spending more time on operations
- Difficulty getting to Zero Trust architectures
- Higher cloud operational costs
- Lower agility for cloud administrators

Amazon DataZone – Overview

AN AWS NATIVE DATA CATALOG FOR ORGANIZED, GOVERNED, AND SELF-SERVICE DATA ACCESS

Data Producers

- Teams who want to share data
- Data On-Premises
- SaaS Applications
- AWS Data Exchange



Data Consumers

- Teams who want to use data
- Analytics Tools
- Authorized 3rd Parties

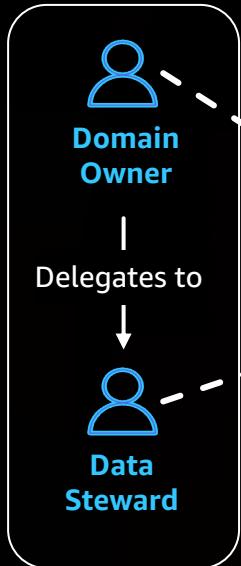


- 1 Data is put into organizational domains, with curated metadata, a business glossary, and a robust picklist and labeling for fields
- 2 Data objects are unified under a project and allow for a common security umbrella and access for Redshift, Athena, Glue, etc.
- 3 Permission fulfillment for Redshift tables and views, Glue Tables, and others to allow and control access to the catalog and projects
- 4 Cross domain and project collaboration is able to be understood through a GUI based and personalized data portal

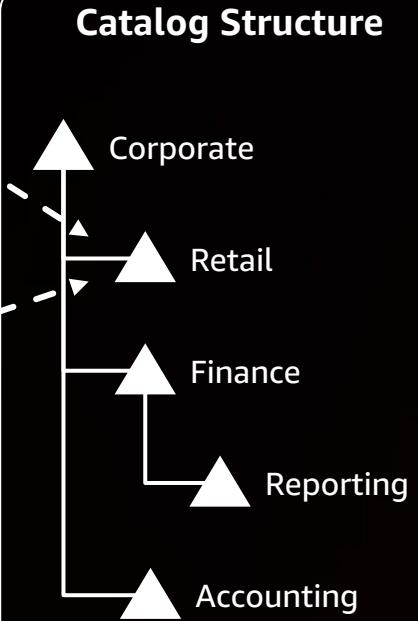
Amazon DataZone – Simplified Workflow

BUILD AND MANAGE DATA BASED ON REAL BUSINESS AND ACCESS STRUCTURES

Administration

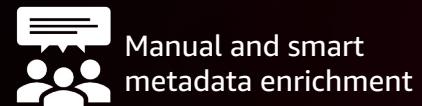


Organizational Domains



Metadata Templates

US Sales		
Sales Metadata Template		
Sales Region	USA	Regions
Sales Year	2021	-
Sales Quarter	Q1	Quarters



Business Glossaries

Regions of Sales	
Asia	• India
	• Japan
Americas	• USA
	• Canada

Easy to Navigate Interface

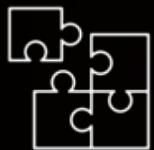
A screenshot of the Amazon DataZone interface. The left sidebar shows navigation options like "Home", "Data Catalog", and "My Projects". The main area displays search results for "Mutual funds domain". It shows three data assets: "Client demographic data", "Client profile data", and "Client education data", each with a "SUBSCRIBE" button. On the right, there are filters for "Data Source Type" (GLUE), "Data Asset Type" (TABLE), "Publishing Job" (client data publish, client data product publishing), "Has PII" (False, True), "Status" (Active), and "Account Id".



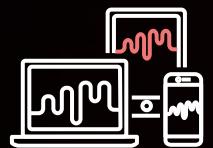
AWS Clean Rooms Overview

SECURELY AND EASILY MATCH, ANALYZE, AND COLLABORATE ON COMBINED DATASETS WITH PARTNERS

- Collaborate with customers or partners without sharing or revealing raw data
- Protect underlying data with privacy-enhancing controls and enforcement
- Use flexible, easy-to-configure analysis rules to authorize or restrict query operations
- Cryptographic computing techniques so data stays encrypted during collaboration



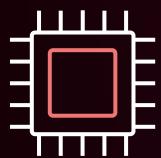
**Multi-Party
Collaborations**



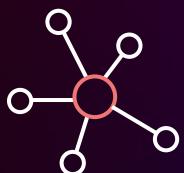
**No AWS Data
Movement**



**Query Controls
and Enforcement**



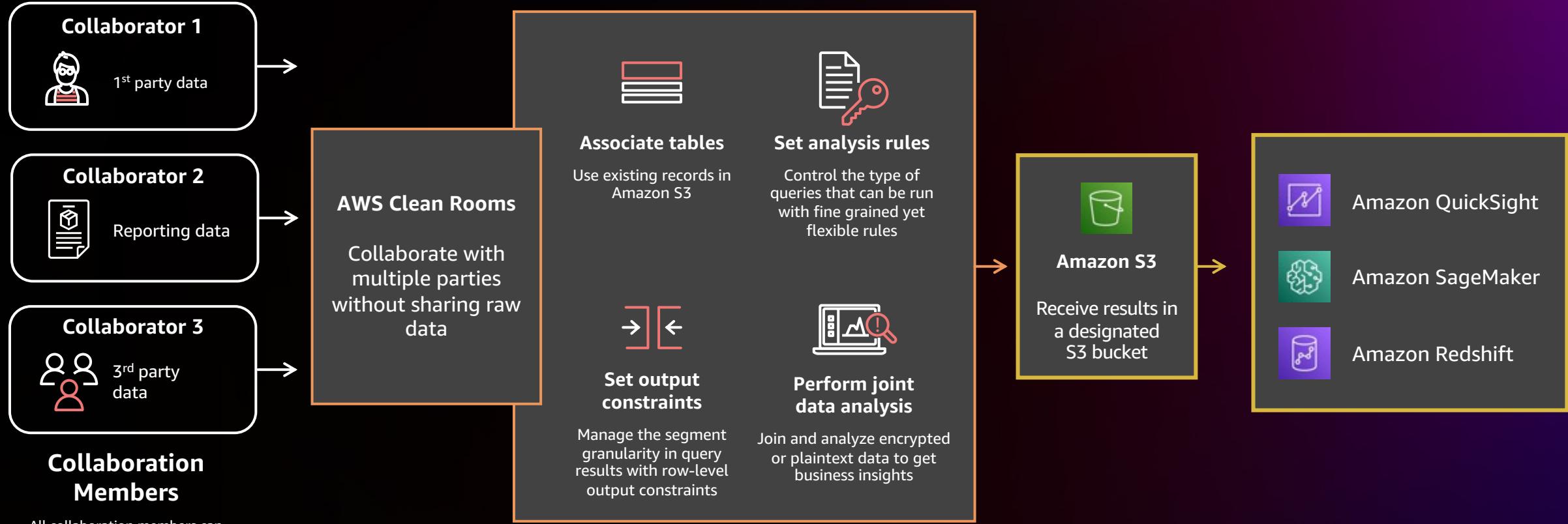
**Cryptographic
Computing**



**Programmatic
Access**

Amazon Clean Room Functionality

MANY CUSTOMERS HAVE NEVER EVEN TRIED THIS KIND OF DATA EXCHANGE DUE TO CONTROL CONCERNS



Amazon OpenSearch Serverless

FIRST VIEW OF A MANAGED-MANAGED OPENSEARCH SERVICE

Available in Preview

Start with a moderate size workload (24GiB) that is non-prod until full version is released.

Start Testing in Seconds

1. Create collections (groups of indices)
2. Ingest data using existing clients and pipelines
3. Query indices using existing APIs
4. Analyze data with familiar OpenSearch Dashboards

Search and Analyze Data in Seconds

Fast Data Ingestion Rates

Millisecond Query Response Times

YOU

Secure and Compliant

Compute Provisioning

Automatic Scaling

High Durability

Built-in Resiliency

Automated Patch Management

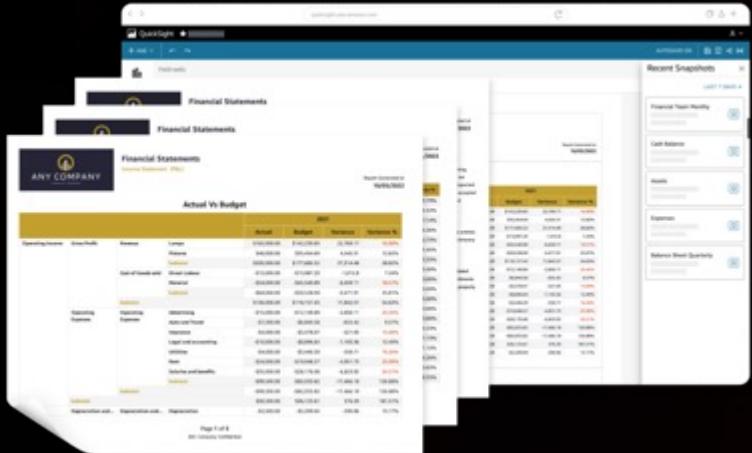
Advanced Monitoring



Amazon QuickSight Reporting Updates

UPDATES BASED ON COMMON CUSTOMER ASKS FOR PRINTABLE REPORTS AND CLUSTERED DATA VISUALS

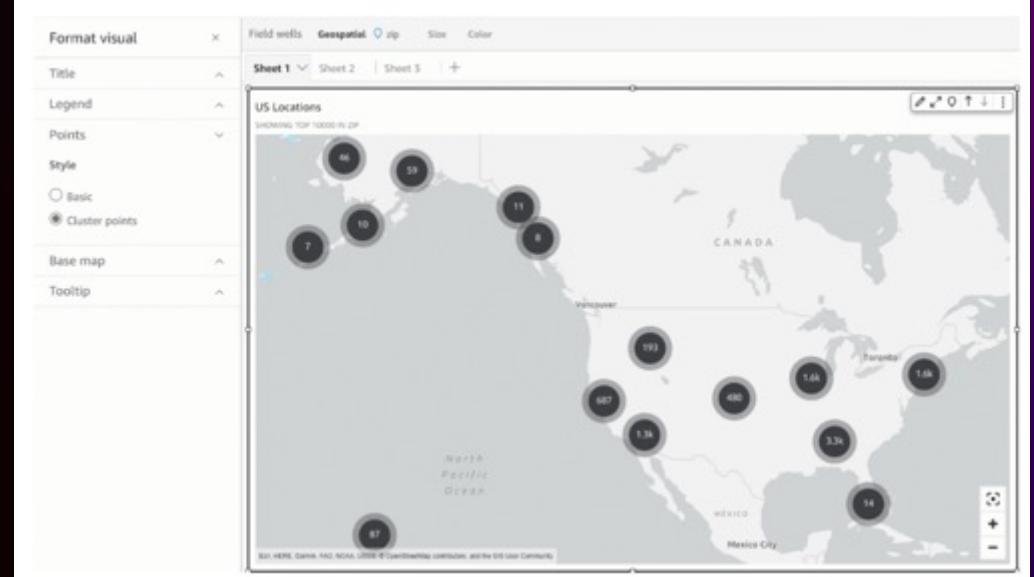
Paginated Reports



To help our many end users, particularly C-Suite and Board members, will want to see reports provided in printable or print-like formats.

Save months of time a year by automatically generating traditional executive reports.

Cluster Points for Geospatial Visuals



Dashboards now have the ability to cluster points to improve readability of their geospatial visuals. This means when data points are clumped together, they will be visualized with a number to allow users to find patterns and identify key locations faster.

QuickSight with Extended API Capabilities

GENERATE QUICKSIGHT BY CODE TO ORCHESTRATE AND AUTOMATE YOUR DASHBOARDS

```
AWS Blog Sample Code AaC > ||| dashboard-global-sales.json > {} Definition > [ ] Sheets > {} 0 > [ ] Visuals > {} 0 > {} BarChartVisual > {} Title
```

```
171     "Sheets": [
```

```
172       {
```

Access the underlying QuickSight Dashboards and analytics using the AWS SDK to edit, review, and launch code.

```
180   "FormatText": {
```

```
181     "RichText": "<visual-title>SALES BY CATEGORY II
```

```
182   },
```

```
183   "Visibility": "VISIBLE"
```

```
184 }
```

```
185   ],
```

```
186   "Actions": [],
```

```
187   "VisualId": "a17b7e95-08ed-4d75-a60b-60befb7484e3_84af1",
```

```
188   "ColumnHierarchies": [],
```

```
189   "ChartConfiguration": {
```

```
190     "SortConfiguration": {
```

```
191       "CategorySort": [
```

```
192         {
```

```
193           "FieldSort": {
```

```
194             "Direction": "DESC",
```

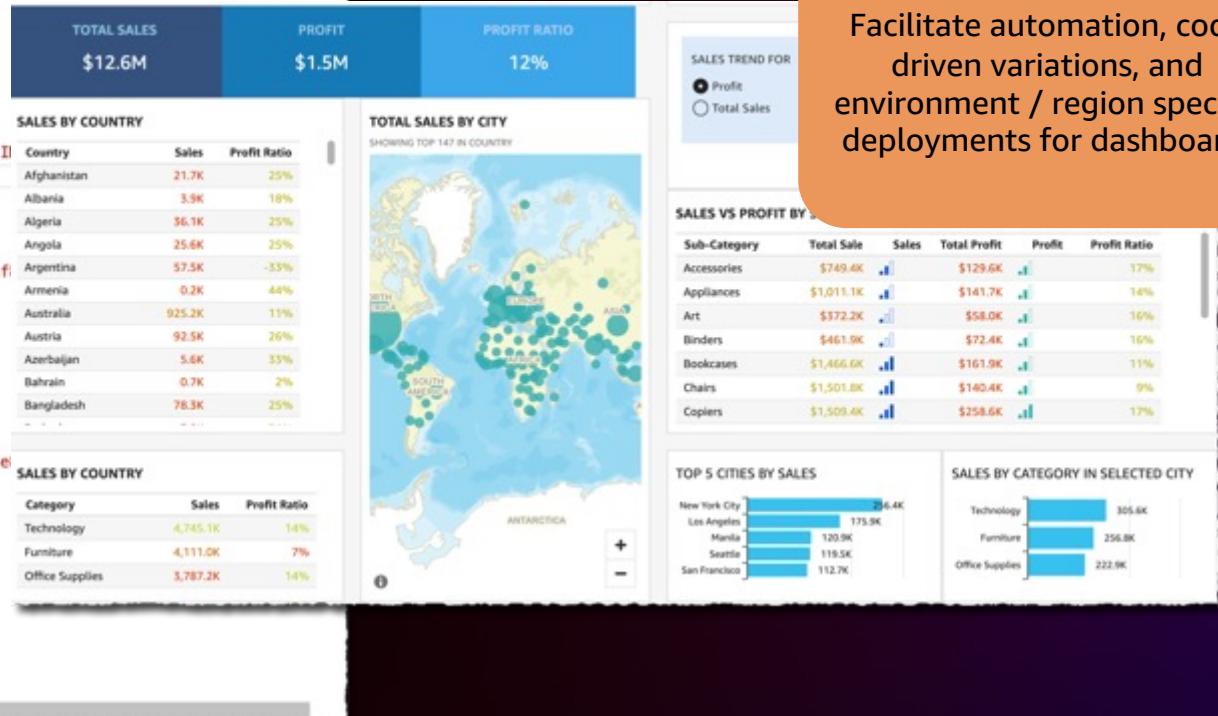
```
195             "FieldId": "6289dce8-ceff-4341-96e
```

Treat QuickSight Dashboards as a code asset for updates, launches, versioning, and control by your CI/CD, IaC, and git systems.

```
202   "VisualPalette": {
```

```
203     "ChartColor": "#37C1EE",
```

```
204     "ColorMap": []
```



Facilitate automation, code driven variations, and environment / region specific deployments for dashboard.



QuickSight Q Time Saving Additions

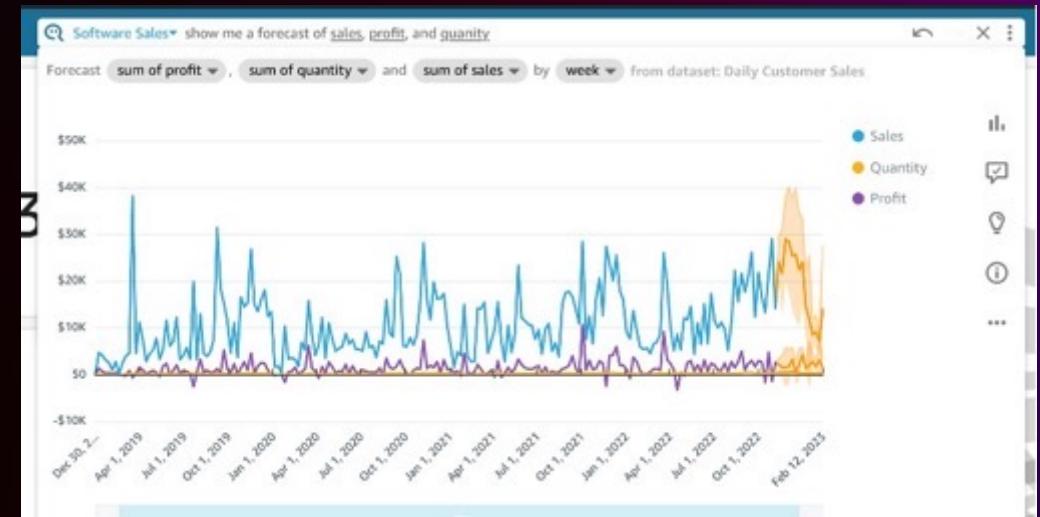
DATA WILL BE PREPARED TO BE EASILY USED WITH Q AND NEW Q PROMPTS WILL PERFORM NEW ANALYSIS

Automated Data Prep

The screenshot shows the 'Data Fields' tab of the QuickSight Q interface. It lists various fields such as Customer, Row ID, Order ID, Order Date, Data Key, Customer Contact, and Country. Each field has a 'Friendly name' column, a 'Include' checkbox, and a 'Synonyms' section. The 'Synonyms' section contains alternative names for each field, such as 'Buyer', 'purchaser', 'Company', 'client', 'Order Number', 'Order ID', 'Order Date', 'Data Key', 'Customer Contact', and 'Country'. The 'Details' section provides further information like dimension type and count.

AI-enhanced automated data preparation to make it fast and straightforward to augment existing dashboards for natural language questions

QuickSight Q New Question Types

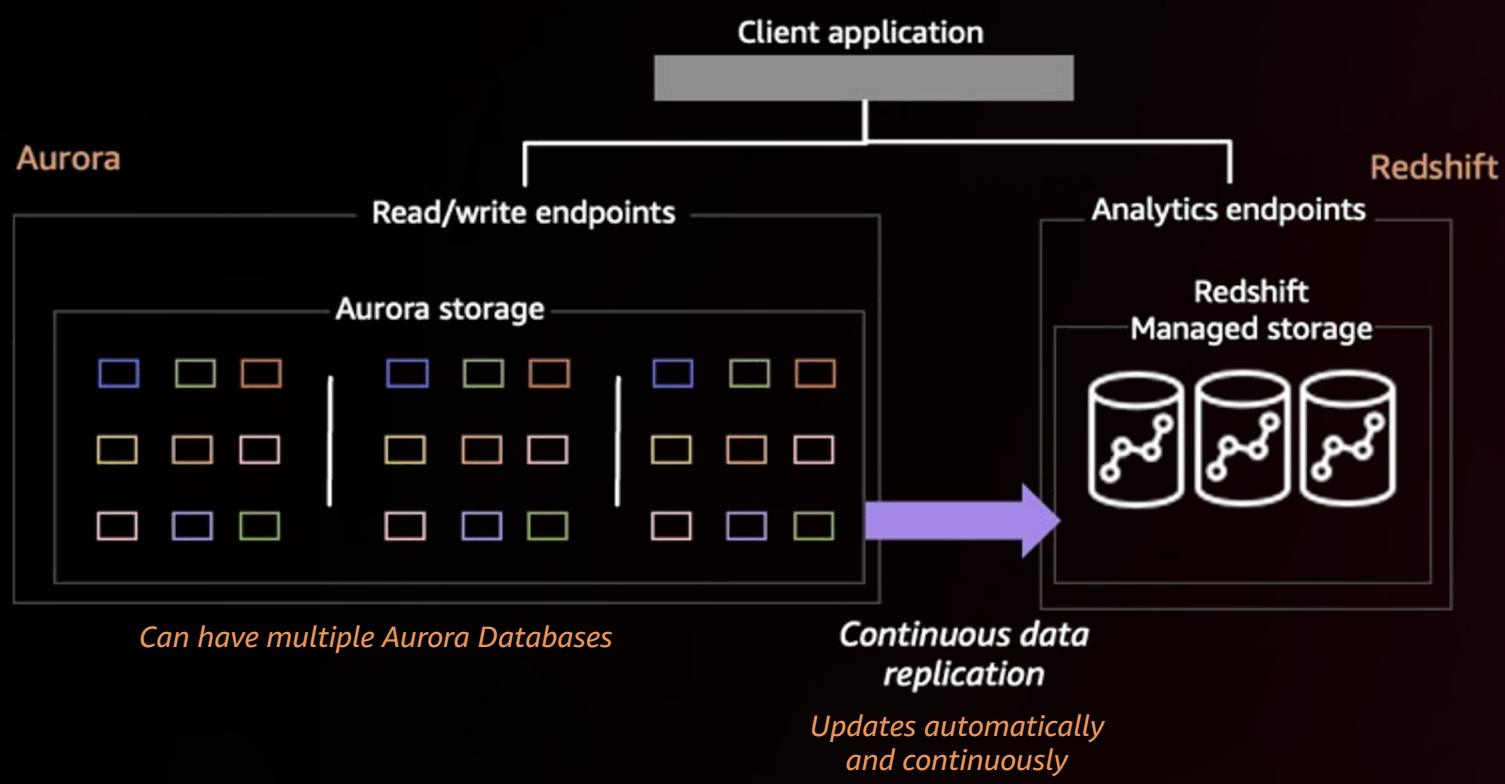


"Forecast..." – Predict future trajectories for up to three measures

"Why..." – Perform contribution analysis to identify statistical drivers

Zero-ETL from Aurora to Redshift

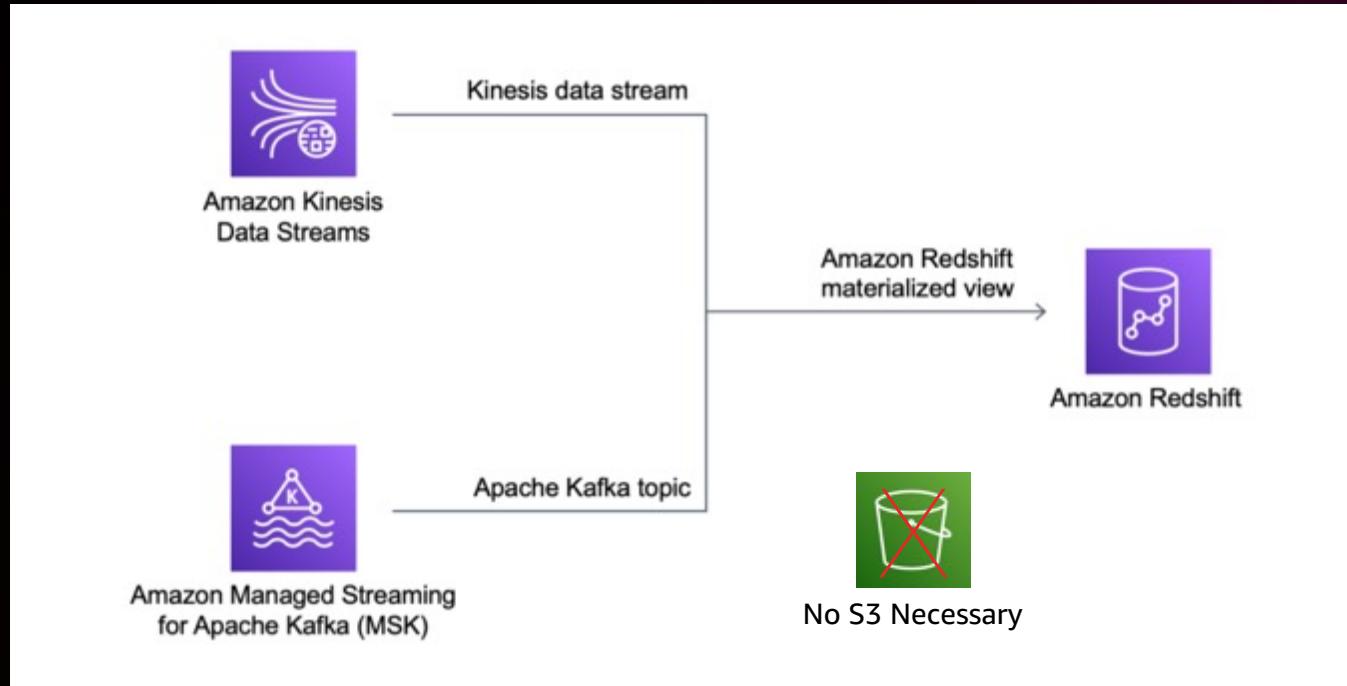
CONTINUOUS AND "NEAR REAL-TIME" INTEGRATION OF DATA FROM AURORA TO REDSHIFT



- Transactional data is available within seconds of being written into Aurora
- Data is available in Amazon Redshift, so you don't have to build and maintain complex data pipelines
- Perform extract, transform, and load (ETL) operations

Streaming Ingestion for Kinesis Data Streams and MSK Kafka Into Redshift

SKIP THE S3 STEP AND DIRECTLY INGEST STREAMING DATA INTO REDSHIFT FROM KINESIS AND MSK

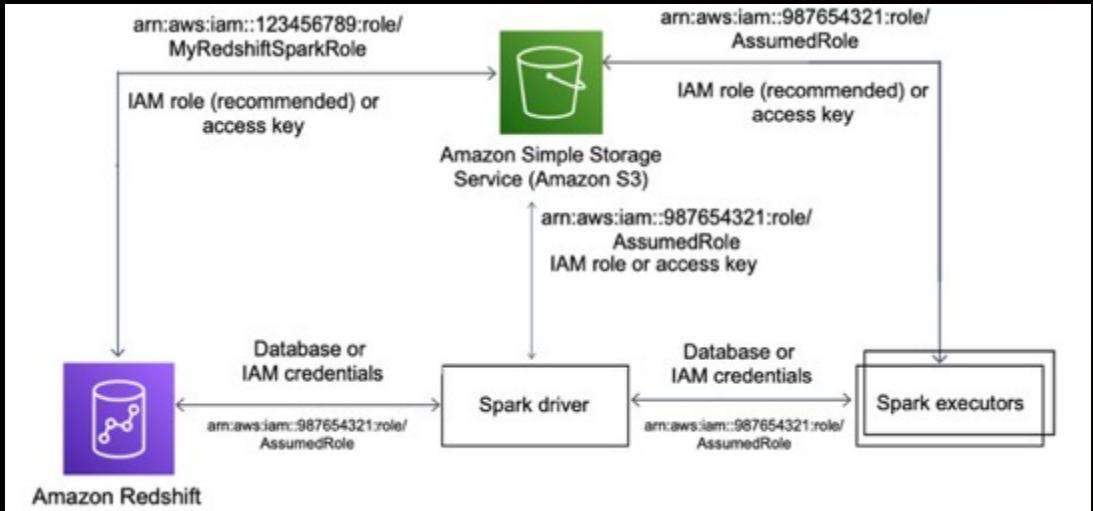


- Load streaming data without staging data in S3, to allow less time till Redshift processing and easier file formatting
- Create an external schema and a materialized view that references either type of streaming object
- Both data types can be used independently, combined with each other, or existing data for use by direct query or applications

Amazon Redshift for Spark Apps and HA Apps

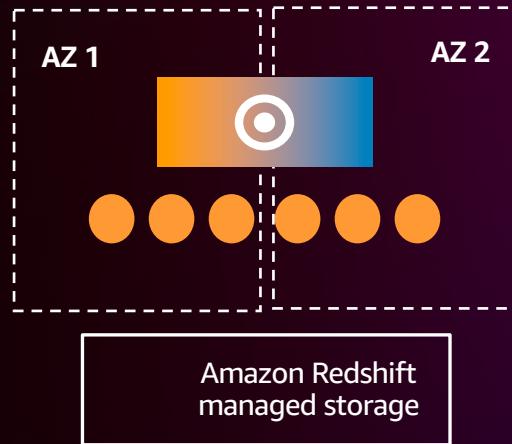
NATIVE CONNECTOR SPARK APPLICATION INTEGRATION AND AN INITIAL VERSION OF MULTI-AZ CLUSTERS

Seamless Apache Spark



- Connect your Spark-based Applications to move data from your Redshift cluster
- Capabilities already include sort, aggregate, limit, join, and scalar functions
- Built off of an existing open-source project

Preview of Multi-AZ Redshift Clusters



- Multi-AZ Amazon Redshift deploys equal compute resources in two Availability Zones that can be accessed through a single endpoint
- During an AZ Failure, the remaining compute resources in the second Availability Zone will be available to continue processing workloads
- Amazon Redshift Multi-AZ is designed for workloads that can not be replicated or tolerate any data loss in the event of a failure
- Amazon Redshift charges the same hourly compute rates for RA3 when running a Multi-AZ cluster (Only for RA3 Instances)

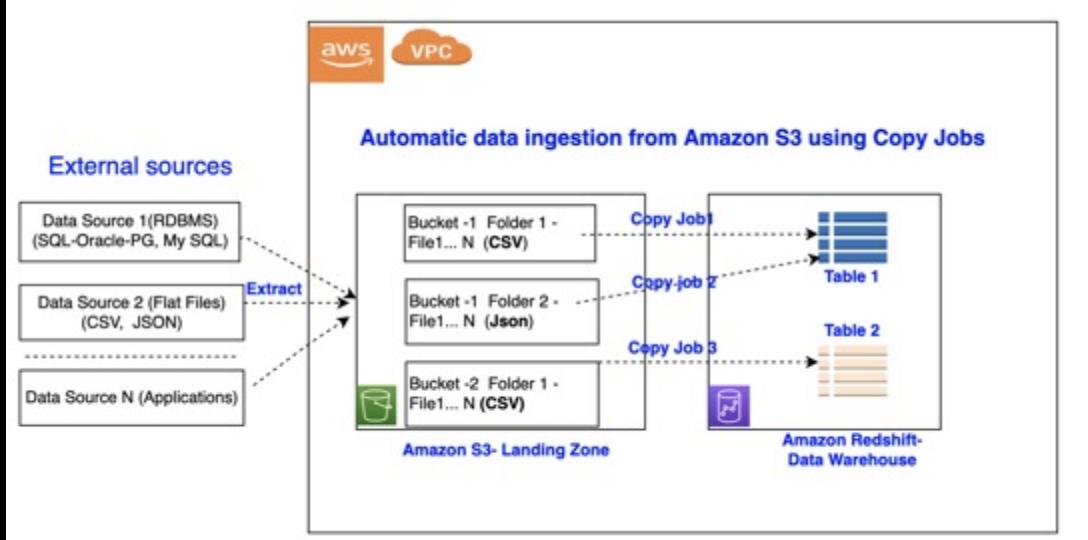


Amazon Redshift New S3 and Query Capabilities

MORE NATIVE INTEGRATION FOR S3 COPYING TO REDSHIFT, PLUS NEW REDSHIFT SQL COMMANDS

Auto-copy from Amazon S3

- Loads data into Redshift from S3 automatically
- Store COPY commands in a Copy Job and automatically load new files detected from the identified S3 path into their Redshift local tables
- Automatically detects duplicate and previously loaded files



Extended Redshift SQL Capabilities

- New SQL Functions for Redshift
 - MERGE - conditionally insert, update, and delete from target tables based on existing and new source data
 - ROLLUP, CUBE, GROUPING SETS – Perform multi-dimensional analysis by offloading the complex aggregation logic and run OLAP queries as part of your SQL
- Larger semi-structured data sizing, up to 16MB, when ingested from JSON or PARQUET source files (previously 1MB), simplifying the data ingestion and minimizing the pre-processing from large nested data

Amazon AppFlow supports over 50 Connectors

EXPANDING INTEGRATION OPTIONS ACROSS ENTERPRISE SAAS

Recently Released Highlights

- Redshift PrivateLink connectivity
- SAP now including ODP support
- Salesforce Marketing Cloud
- Google Analytics 4
- AWS Glue Data Catalog Integration



New Marketing Connectors

- Facebook Ads
- Facebook Page Insights
- Google Ads
- Google Search Console
- Instagram Ads
- LinkedIn Ads

New Customer Service and Engagement Connectors

- MailChimp
- Sendgrid
- Zendesk Sell
- Zendesk Chat
- Zendesk Sunshine
- Freshdesk
- Okta
- Typeform

As well as:

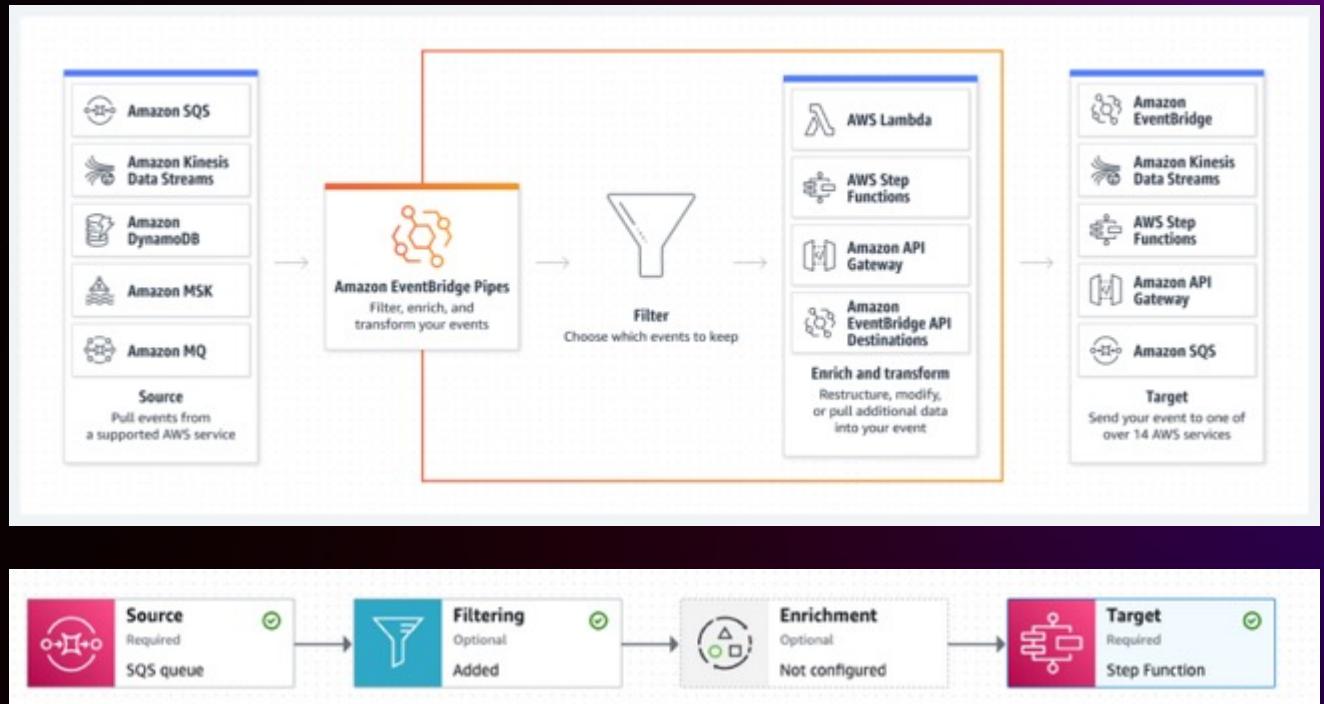
- Microsoft Teams
- Zoom Meetings
- Stripe
- Amazon RDS for PostgreSQL
- QuickBooks Online
- Jira Cloud
- GitHub
- GitLab
- CircleCI
- DocuSign Monitor
- Domo



Amazon EventBridge Pipes

SEAMLESSLY INTEGRATE EVENT PRODUCERS AND CONSUMERS IN A VISUAL CANVAS FOR EVENT BASED APPS

- Visually create point-to-point integrations between event producers and consumers
- Select from EventBridge supported data sources
- Select event filtering, batching, concurrency, and other pipeline processing parameters
- Enrich, augment, or transform events using Lambda functions, Step Functions, or other APIs
- Deliver the event to the EventBridge data consumer



AWS Glue Data Quality

MANAGED DEEQU (COMMON DATA QUALITY ANALYSIS TOOL) CAN BE INTEGRATED WITH GLUE AND STUDIO

Example of Data Quality Recommendations In Glue Console

Rules (DQDL)
Data quality definition language

```
Rules = [
    RowCount between 2721681 and 10886724,
    IsComplete "VendorID",
    ColumnValues "VendorID" in ["2", "1", "6", "5"],
    StandardDeviation "VendorID" between 0.48 and 0.53,
    ColumnValues "VendorID" <= 6,
    IsComplete "tpep_pickup_datetime",
    IsComplete "tpep_dropoff_datetime",
    Completeness "passenger_count" >= 0.96,
    StandardDeviation "passenger_count" between 0.93 and 1.03,
    ColumnValues "passenger_count" <= 9,
    IsComplete "trip_distance",
    StandardDeviation "trip_distance" between 571.45 and 631.61,
```

After evaluating the data, common patterns were identified, like some values appear to commonly be within a range or never blank. These rules can be easily updated and modified, but were automatically generated.

Example of Setting Up Policy in Glue Studio

The screenshot shows the AWS Glue Studio interface with the 'Data quality' tab selected. A modal window titled 'DQDL rule builder' is open, showing a list of rule types: Action, Target, Undo, Redo, Remove, Node properties, Transform (which is selected), Output schema, and Data preview. The 'Transform' section contains a search bar and a list of actions: Change Schema (Apply Mapping), Join, SQL Query, Detect Sensitive Data, Evaluate Data Quality (which is highlighted with a blue border), Fill Missing Values, Aggregate, Custom Transform, and Drop Duplicates. Below this, the 'Evaluate data quality' section is visible, along with the 'Data quality rules' section which includes a code editor showing DQDL rules. The code editor contains the following DQDL rules:

```
1 Rules = [
2     Completeness"year">0.8
3 ]
```



AWS Glue Support, New Ray Engine, and Sharing

NEW VERSION SUPPORT, NEW PYTHON ENGINE SUPPORT, AND EASIER EXPORT OF VISUAL TOOLS

AWS Glue 4.0 Updates

Supports the latest versions of Spark (3.3.0), Python (3.10), and Scala (2.12); and native support for Apache Hudi (0.12.0), Delta Lake (2.1.0), and Apache Iceberg (1.0.0)

Upgrades connectors for native AWS Glue database sources such as RDS, MySQL, and SQLServer, which simplifies connections to common database sources.

Native support for the new Cloud Shuffle Storage Plugin for Apache Spark and enables Adaptive Query Execution for dynamically optimized queries

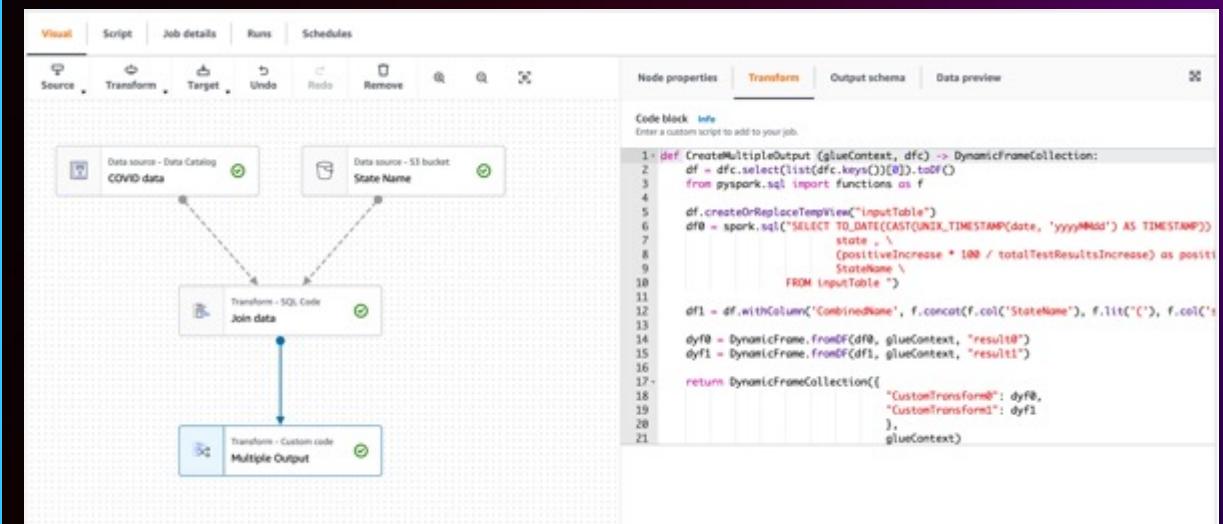


AWS Glue for Ray

In addition to existing Glue engines for Python Shell and Apache Spark, you can now run AWS Glue for Ray

Ray is an automation tool for scaling Python and Glue for Ray facilitates the distributed processing of Python code over multi-node clusters

AWS Glue Custom Visual Transforms

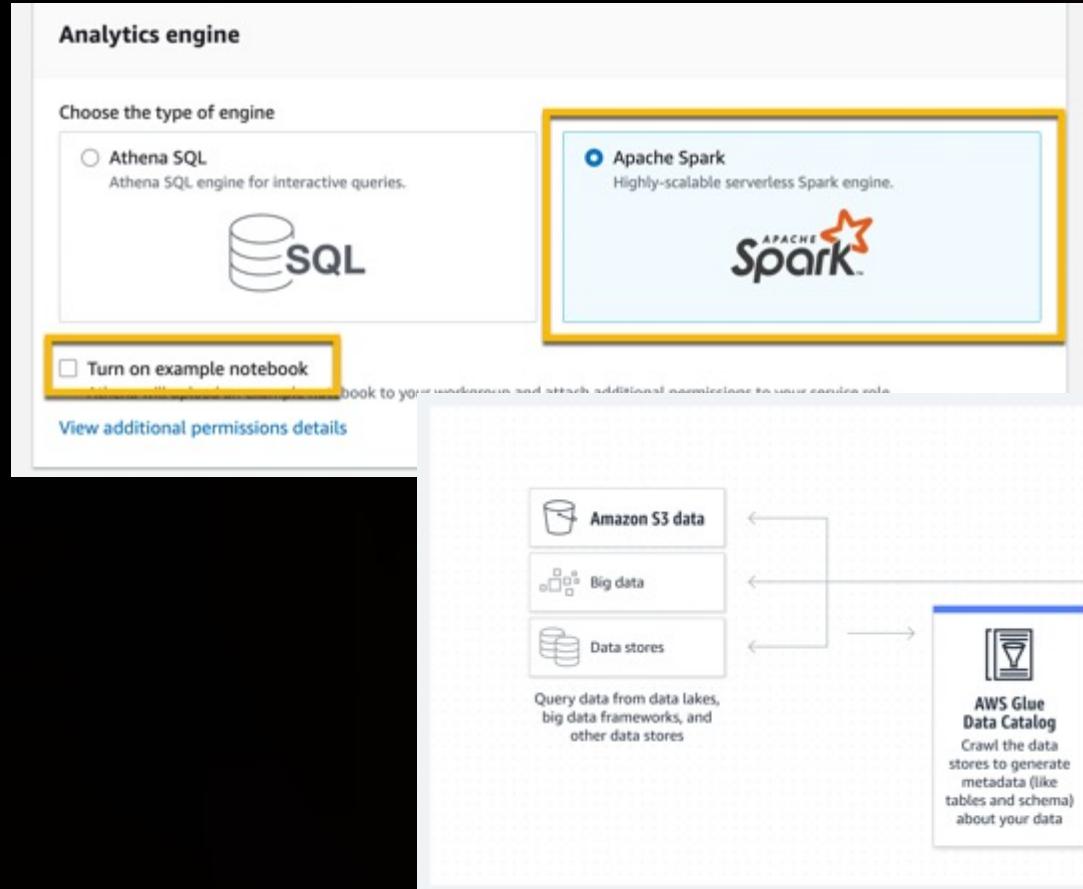


Share your visual job editor components to discover, prepare, move, and integrate data faster; all while maintaining consistency across teams.

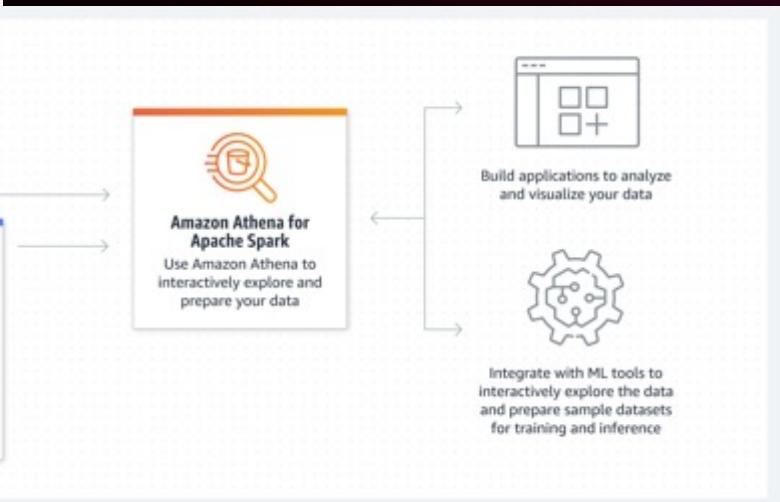


Amazon Athena for Apache Spark

SERVERLESS SPARK INTERFACE FOR ATHENA CREATES NOTEBOOK OR APIS FOR SPARK JOBS IN SECONDS



- Run Apache Spark workloads, use Jupyter Notebook as the data processing interface on Athena, and interact with Spark applications using Athena APIs
- We can start Apache Spark in under a second without having to manually provision the infrastructure
- Uses the same DPU pricing model as Glue Spark Jobs, but at 20% discount and free notebooks



AI / ML



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Amazon CodeWhisperer

ML-POWERED CODING COMPANION IMPROVES DEVELOPER PRODUCTIVITY AND CODE QUALITY

Generates code recommendations:

- Entirely new code based on context
- Code from plain English comments
- Complete functions

Supports Enterprise admin controls and can perform security scans

Available for all major IDEs as an extension

- Ex. JetBrains, VS Code, Cloud 9, Lambda Console

Supports popular languages:

- C#, Python, Java, JavaScript, TypeScript

```
# Write a function to upload a file to S3.  
def upload_file_to_s3(file_name, bucket_name, object_name):  
    """  
    Uploads a file to an S3 bucket  
  
    :param file_name: File to upload  
    :param bucket_name: Bucket to upload to  
    :param object_name: S3 object name. If none then file_name is used  
    :return: True if file was uploaded, else False  
    """  
  
    # Upload the file  
    s3_client = boto3.client('s3',  
                            aws_access_key_id=AWS_ACCESS_KEY_ID,  
                            aws_secret_access_key=AWS_SECRET_ACCESS_KEY,  
                            region_name=AWS_REGION_NAME)  
  
    try:  
        s3_client.upload_file(file_name, bucket_name, object_name)  
        print(f'File {file_name} uploaded to S3 bucket {bucket_name} as {object_name}')  
        return True  
    except FileNotFoundError:  
        print(f'File {file_name} not found')
```

Code you write

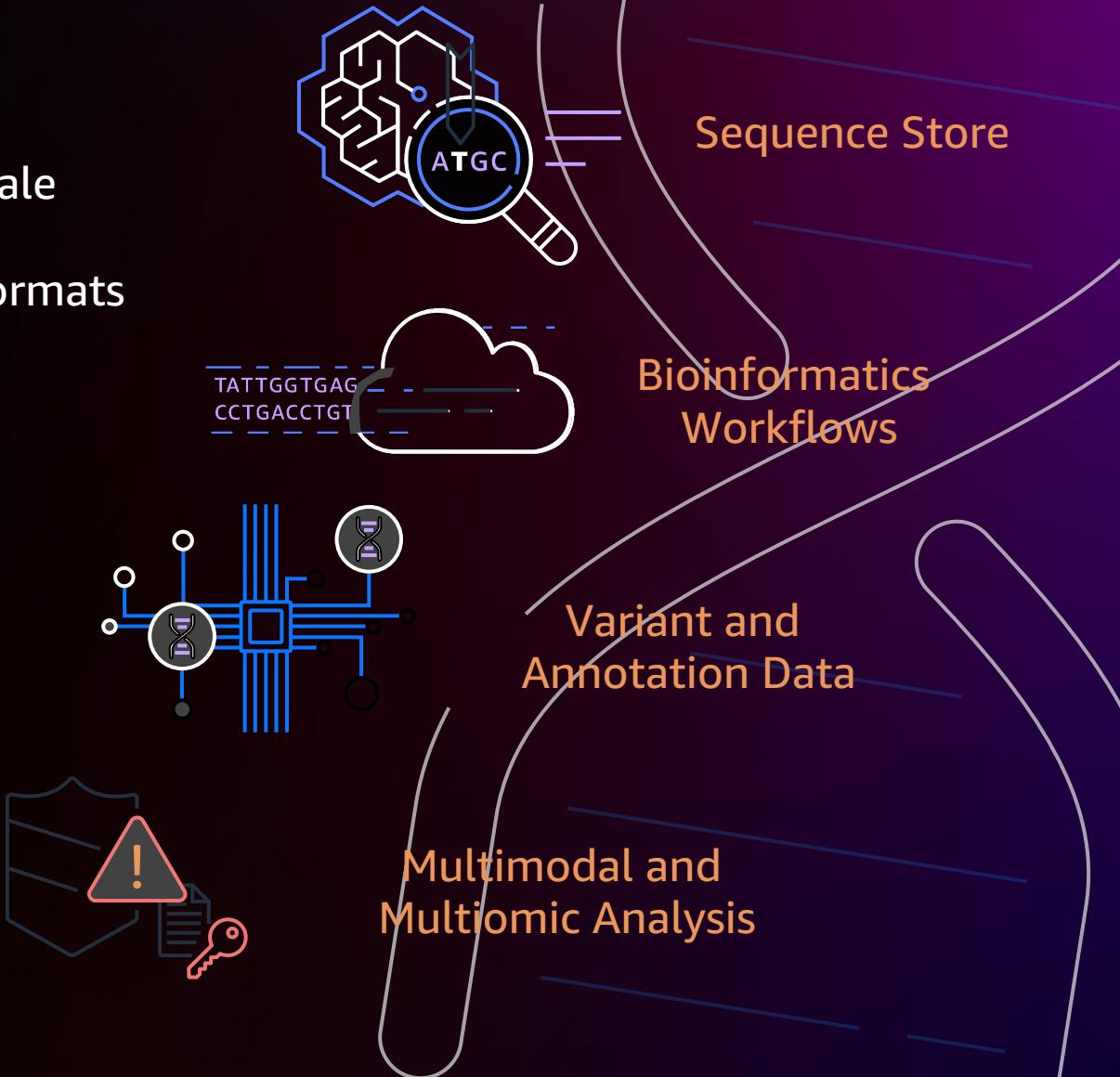
Recommended code the ML contextually matches to this specific use case



Amazon Omics – Life Science Service

STORE, QUERY, AND ANALYZE GENOMIC AND OTHER OMICS DATA FOR INSIGHTS IN HEALTH SCIENCES

- Discover and share bioinformatics data securely at scale
- Ingest and transform genomics data into data lake formats
- Accelerate research using automated workflows
- Run multiomic and multimodal analysis
- Fully managed bioinformatics computation
- Built-in security, privacy, and compliance



Amazon SageMaker Geospatial ML

TAKE GEOSPATIAL DATA INTO ACCOUNT IN YOUR BUSINESS MODEL WITH GEOSPATIAL MACHINE LEARNING

Spectral Index

Band Math

Obtain a combination of spectral bands that indicate the relative abundance of features of interest.



Supported image collections:
Sentinel-2, U

Cloud Masking

Semantic Segmentation

Identify cloud and cloud-free pixels in satellite imagery.

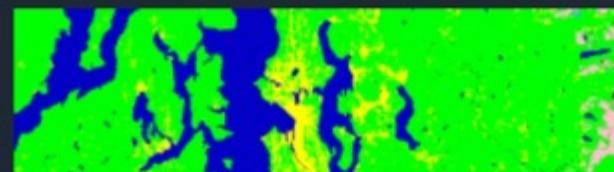


Supported image collections:
Sentinel-2

Land Cover Segmentation

Semantic Segmentation

Identify land cover types such as vegetation, water, bare ground in satellite imagery.

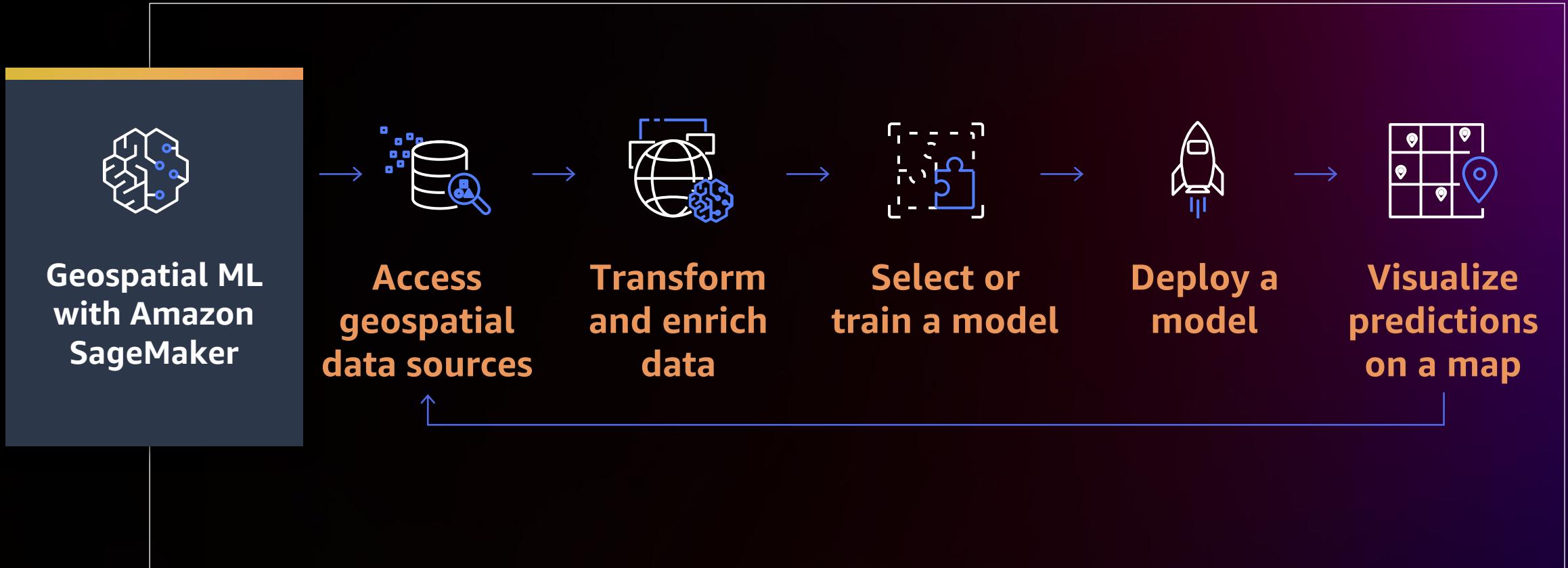


Supported image collections:
Sentinel-2

- Easily acquire geospatial data
- Built-in geospatial data prep operations and transforms
- Accelerate solutions with pre-trained deep neural network models and geospatial operators
- Transform and visualize data with new geospatial notebook and open source libraries



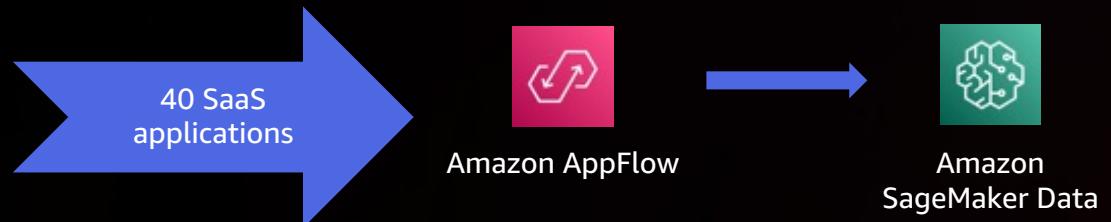
SageMaker Geospatial ML - How it Works



Amazon SageMaker Data Wrangler

STREAMLINING HOW YOU CAN INTEGRATE, PREPARE, AND USE DATA EFFICIENTLY

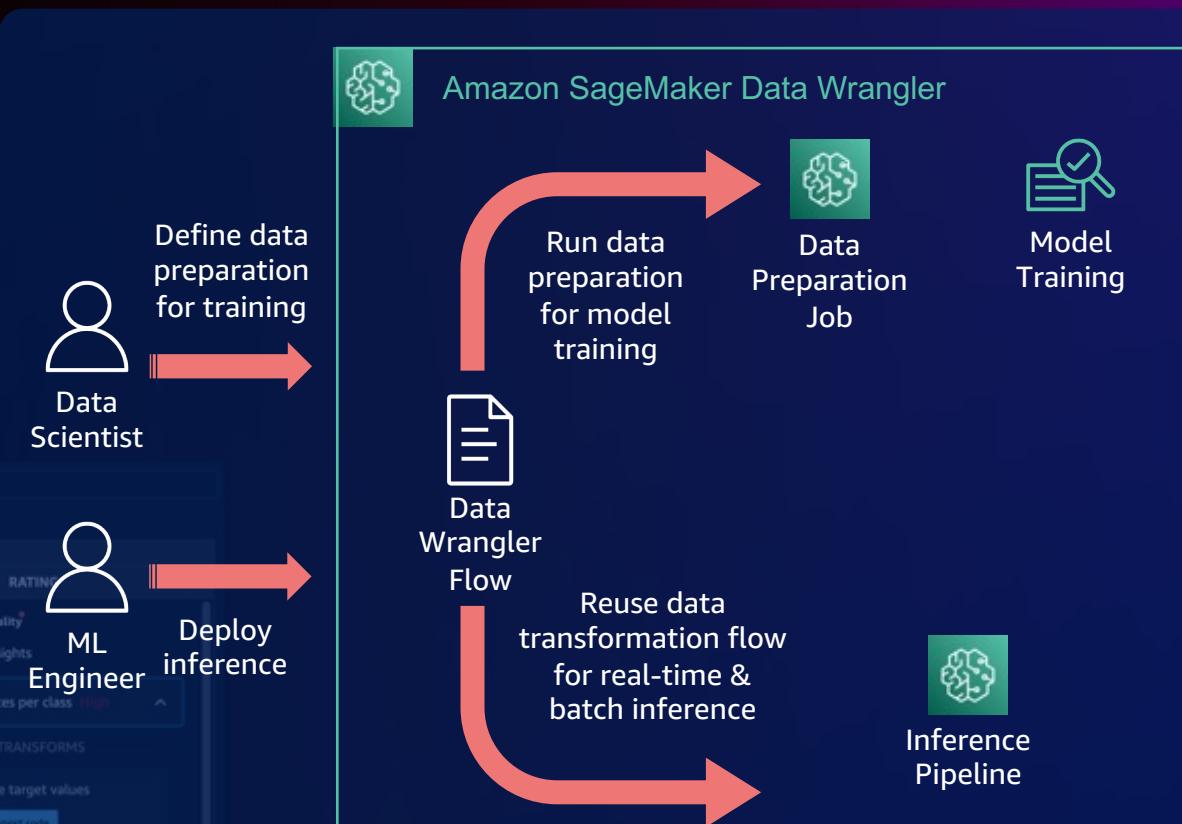
New SaaS Application Integration for Data Wrangler



Data Wrangler Data Prep in Studio Notebooks

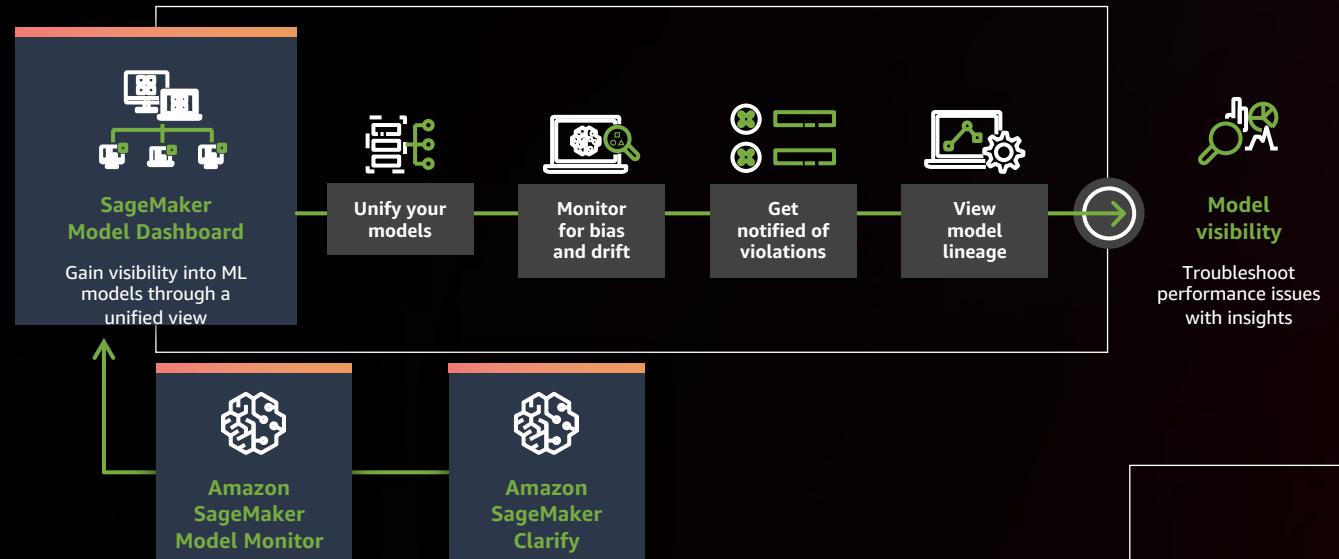
A screenshot of the Amazon SageMaker Data Wrangler Data Prep in Studio Notebooks interface. It shows a Pandas DataFrame with columns: Title, Review Text, Rating, Recommended IND, and Positive Feedback Count. The interface includes various data visualization tools like bar charts and histograms, and a sidebar for "Target Column Insights" and "SUGGESTED TRANSFORMS".

Real-Time and Batch Inference Flows

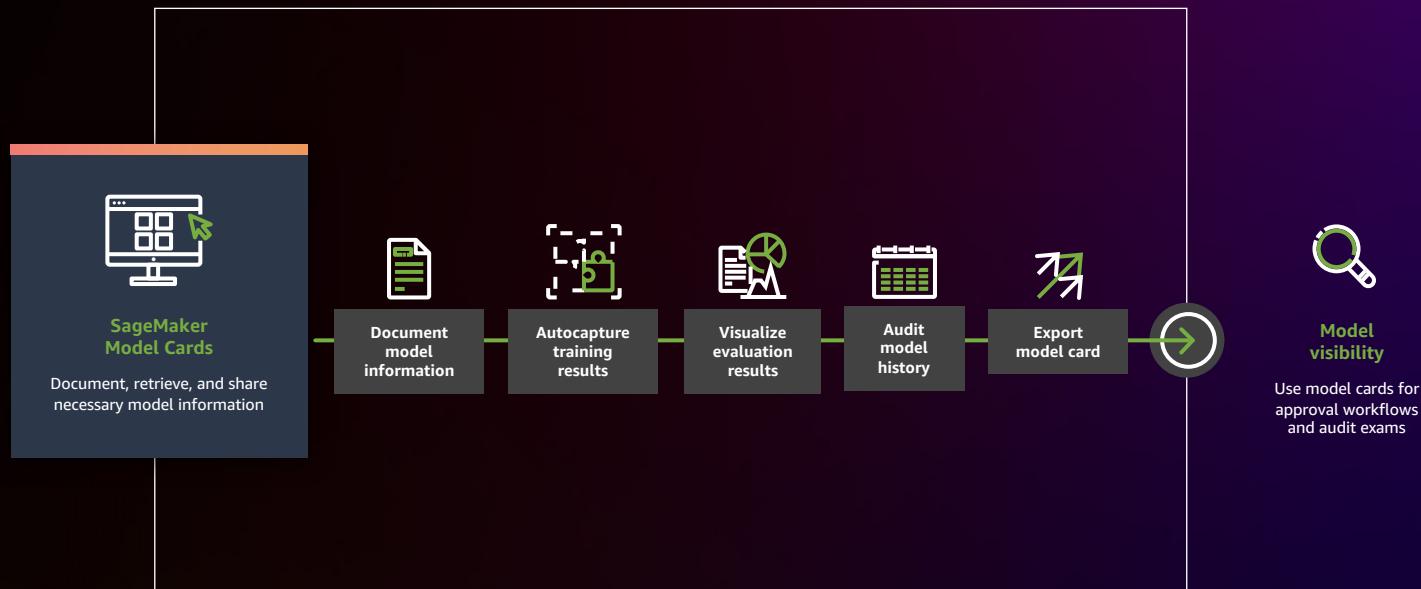


SageMaker Governance – Model Cards and Dashboard

CENTRALIZED AND STANDARDIZED MODEL DATA THROUGH LIFECYCLE WITH UNIFIED MONITORING



Better understanding and standardization for live models



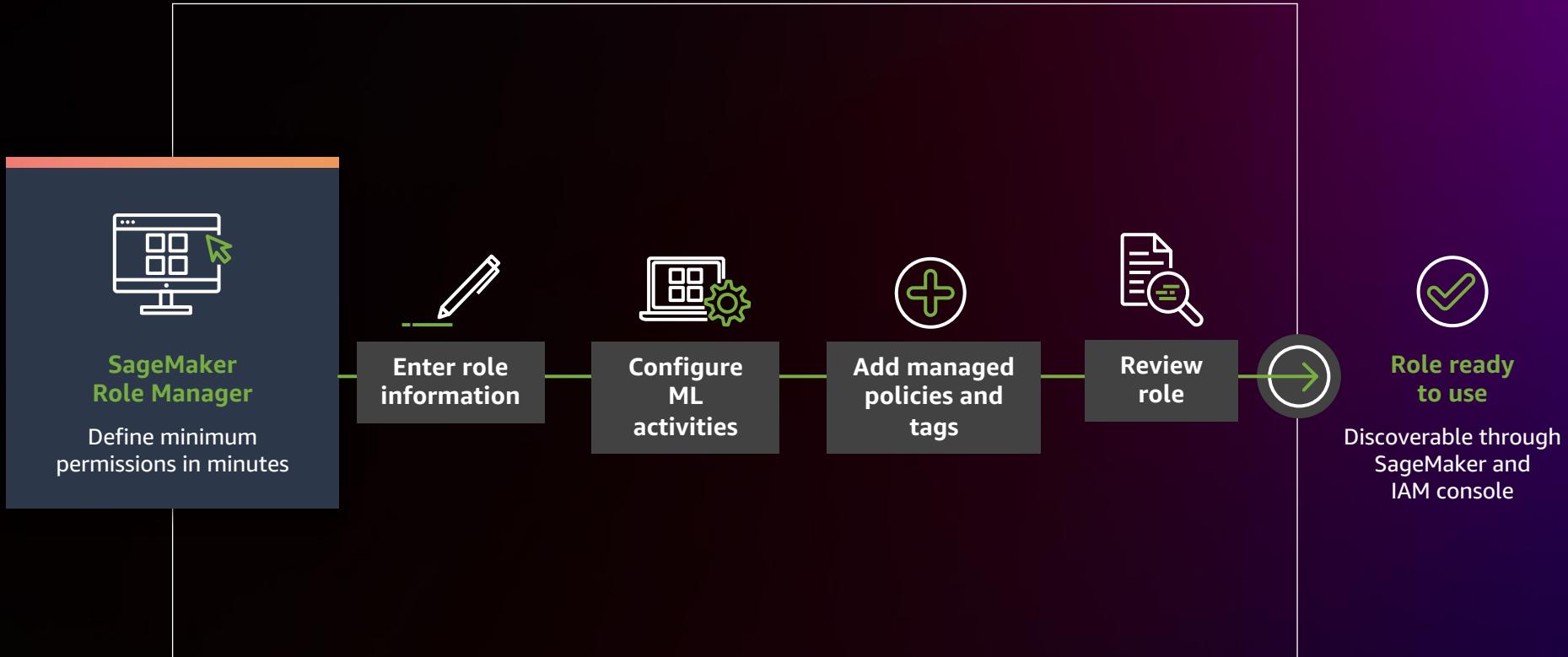
Better understanding and standardization for model production



Amazon SageMaker Governance – Role Manager

SIMPLIFY GRANTING ACCESS AND ROLES FOR SAGEMAKER USERS WHILE MAINTAINING TRANSPARENCY

- Create permission sets for data and services in a single interface
- Add tags and policies for your different services
- Generate IAM Policies based on these settings
- Easy to understand permissions in minutes



Business and Dev Management Apps

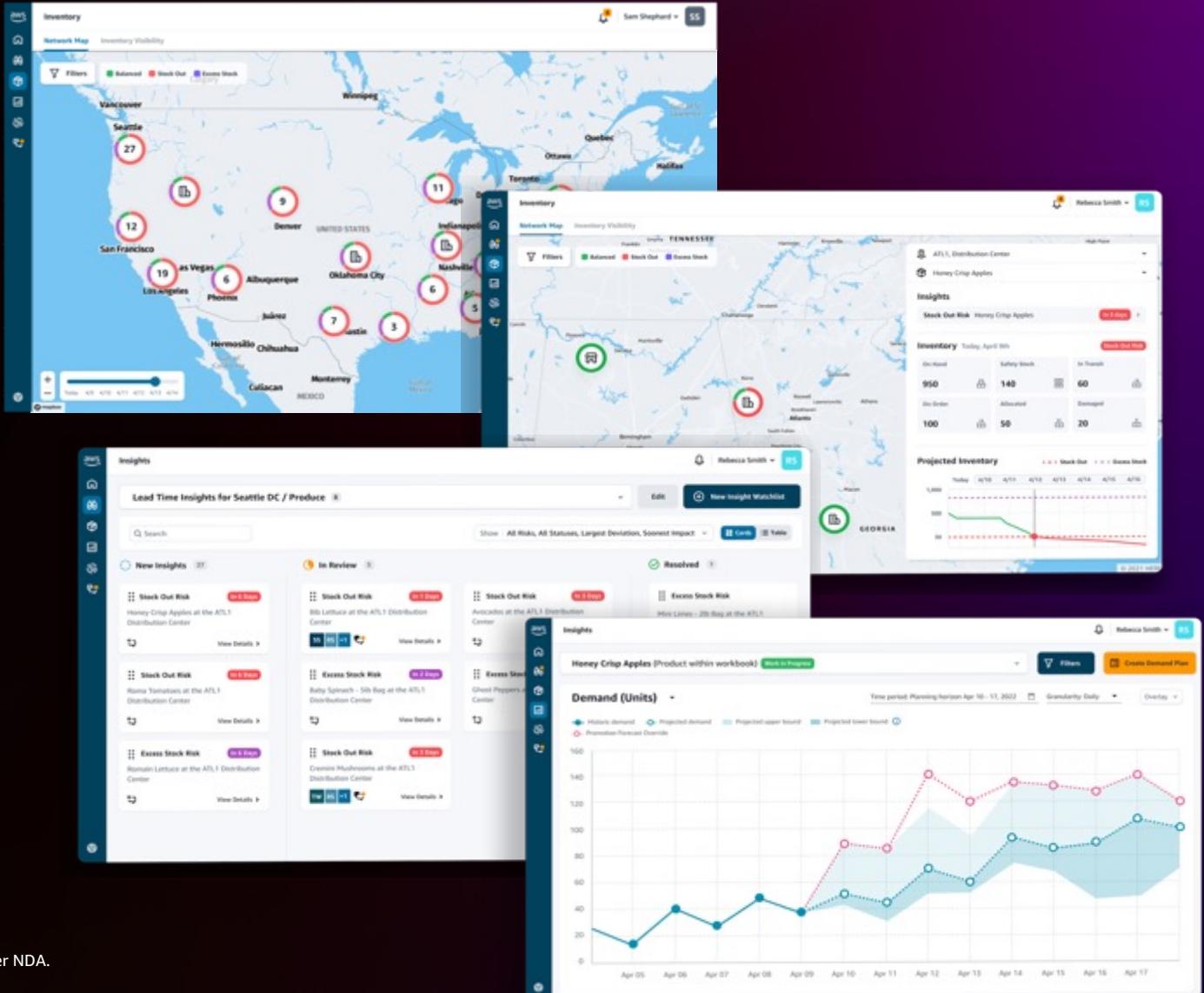


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AWS Supply Chain

PULL IN EXISTING DATA AND USE PROVEN VISUALIZATION AND MODELING FOR INVENTORY AND PLANNING

- Connect, unify, and harmonize data from existing systems
- Contextualize and visualize real-time inventory maps
- Prebuilt connectors for common ERP systems such as SAP S/4HANA, auto-association for EDI 856 using ML NLP, and the ability to take data from S3
- Same pay-as-you-go pricing and scaling, meaning no up-front licensing fees or long term contracts

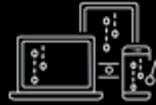


Amazon Powered ML with Explainable Forecasting for Vendor Leadtime Prediction, Demand Planning, and Demand Sensing allows you to generate actionable insights to address supply chain risks

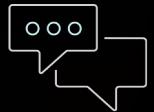


AWS Wickr

OUT-OF-BAND SECONDARY COMMUNICATION FOR REGULATED WORKLOADS AND IR/DR SITUATIONS



Advanced **end-to-end encryption (E2EE)**



Single product with full suite of **collaboration** capabilities



Enterprise management **administrative control** and IT integration



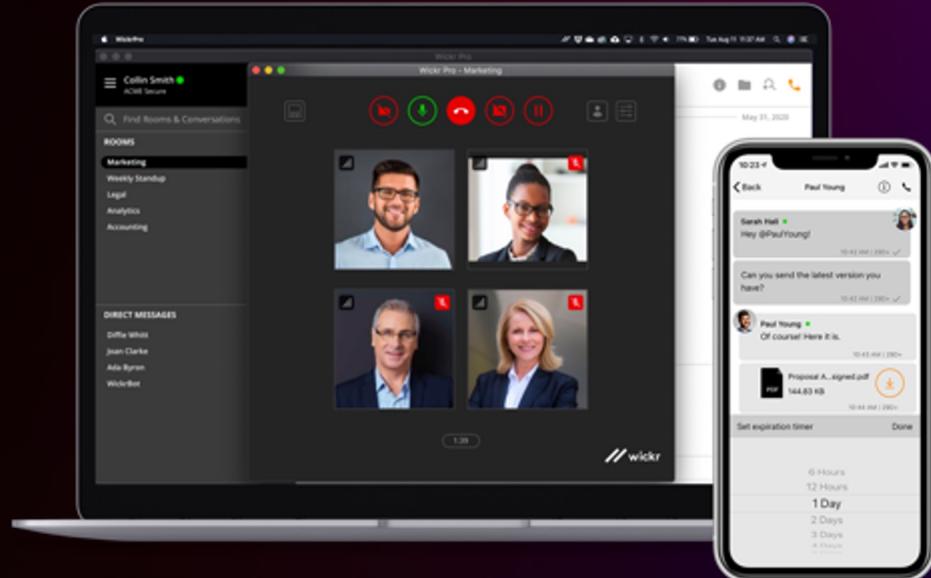
Data retention service supports archiving and data privacy protection



Federated SaaS, self-hosted, and air-gapped **deployment options**



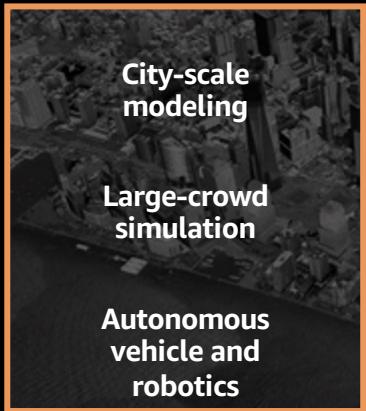
Designed for government, DOD, and health system users, not to replace existing chat/video services, but provide secondary and secure backup during events.



AWS SimSpace Weaver

FULLY MANAGED, MULTI-SERVER COMPUTE SERVICE FOR DEPLOYING LARGE SCALE SPATIAL SIMULATIONS

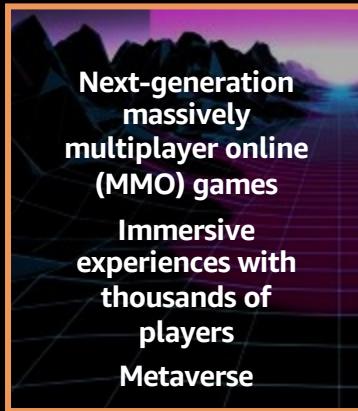
Real-world Simulations



Defense Simulations



Multiplayer Entertainment



Simulation Assets



Gameplay and Simulation Logic

Custom C++

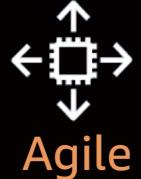


Customer Provided

High-Performance



Agile



Low Cost



Scalable Simulation Infrastructure



SimSpace Provided

Developers create assets, gameplay, simulation logic; SimSpace takes care of the infrastructure deployment, automatic scaling, and data management

Amazon Connect Management Tools

MORE FULL-SCOPED MANAGEMENT TOOLS FOR PLANNING AND EVALUATION

Forecasting, Capacity Planning, and Scheduling

The screenshot shows the 'Edit shift activities' section of the Amazon Connect interface. It displays a grid of staff members (e.g., Alexander, Carlos, Jane, etc.) and their scheduled shifts for a specific day. The interface includes a sidebar for setting activity names and default durations. A modal window titled 'Overtime' is open, showing a timeline from 8 am to 5 pm with several blue bars indicating accepted overtime requests. The interface is designed for managing staff availability and workload.

- Agents have the flexibility to choose when they want to work overtime or take time off, within predetermined, manager-defined limits
- Uses ML to make real-time schedule updates, such as moving or creating additional rest breaks
- Automation frees managers to focus on reviewing performance metrics and coaching agents

Contact Lens Agent Performance Evaluation

The screenshot shows the 'Contact details' page for a specific contact record. It includes sections for 'Contact summary', 'Categories', 'Recording and transcript', and a detailed 'Transcript' view. On the right, there is a 'Evaluations' panel titled 'Helpdesk Evaluation' with three questions: 1. Customer Satisfaction (5/5), 2. Problem Resolution (3/5), and 3. Script & Vocabulary (4/4). Each question has a 'Yes' and 'No' radio button and an 'Add note' link. This allows managers to quickly assess and provide feedback on agent performance.

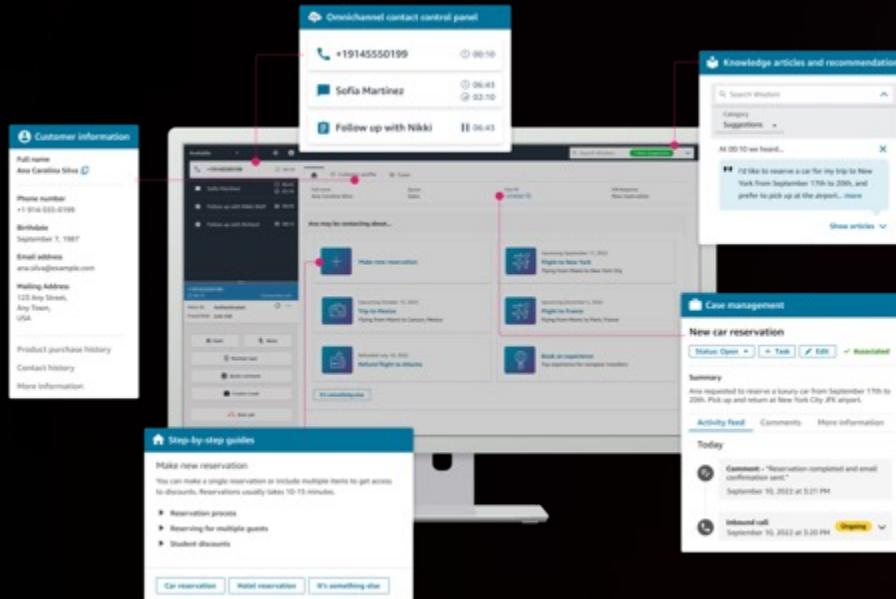
- Contact center managers can create evaluation forms with targeted criteria like compliance or adherence to scripts
- Managers have a more full scope and single pane view of call performance



Amazon Connect Agent Tools

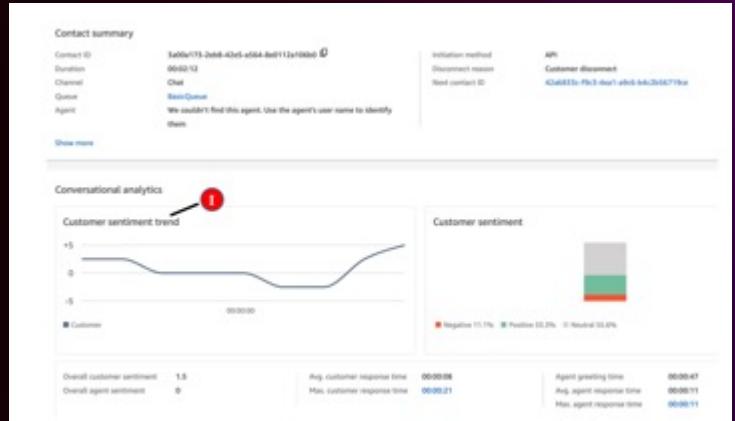
AGENT FOCUSED CAPABILITIES TO HELP IMPROVE AND MEASURE CONTACT SUCCESS

Agent Step by Step Guides



- Create workflows that walk agents through custom UI pages that suggest what to do at a given moment during a customer interaction
- Provide detailed step-by-step guides increase agent productivity and decrease training time
- Design workflows for various types of customer interactions

Conversational Analytics



- AI-powered tool for analyzing agent conversations
- Classify and understand sentiment, trends, and compliance
- Proactively manage conversation quality

Amazon CodeCatalyst

FULLY MANAGED UNIFIED SOFTWARE DEVELOPMENT SERVICE

- Accelerate project setup with integrated tools and well-architected application patterns
- Collaborate fluidly with integrated access to source code, issue tracking, and deployed environments
- Automate daily workflows such as build actions, test suites, and release and deployment
- Use AWS native tools or integrate with existing source control and issue tracking platforms

The screenshot displays the Amazon CodeCatalyst interface, which is a fully managed unified software development service. It includes:

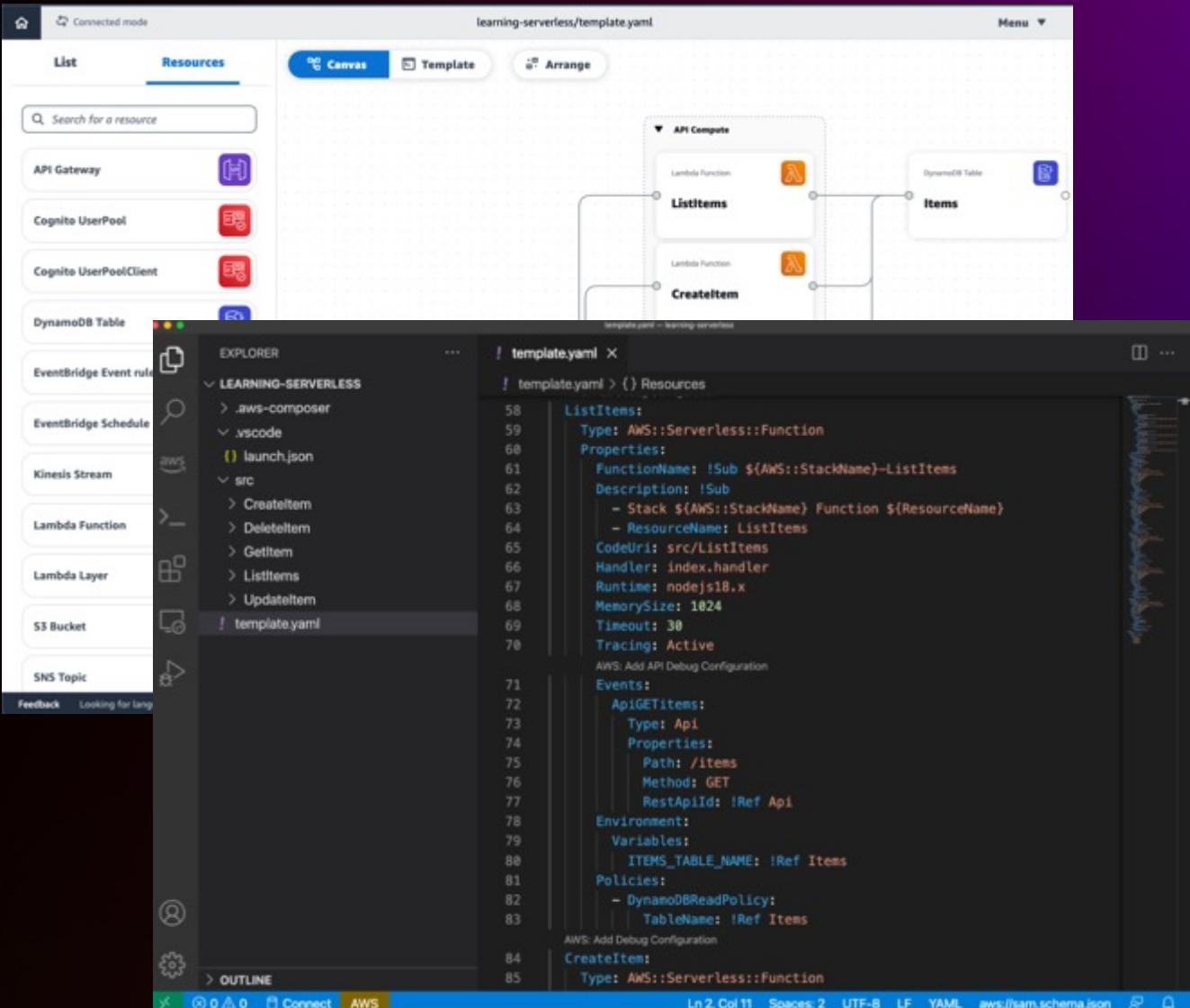
- Create project:** A modal window for setting up a new project named "MythicalSocialApp". It includes fields for Project Name, Project description (optional), and Application name (set to "mysocialapp2").
- WorkflowSource:** A section showing the workflow blueprint with steps: cdk_bootstrap, build_backend, deploy_backend, integration_tests, build_frontend, and deploy_frontend, all set to Environment: Alpha.
- Environments (3):** A list of environments: Prod (Production), Beta (Non-production), and Alpha (Non-production).
- Explore the project:** A summary of the project's status, including a source repository, DevLabs, and project workflows.
- Active issues:** A table listing two issues: "Add Test Coverage for Recommendation Endpoint" and "Engine Selector".
- Open pull requests:** A table listing one pull request: "Adding Requests Dependency".



AWS Application Composer

VISUALLY COMPOSE AND CONFIGURE SERVERLESS APPLICATIONS FROM AWS SERVICES THRU IAC

- Drag and drop serverless resources on a visual canvas
- Group resources into larger architectural components
- Generate deployment-ready configuration
- Import existing CloudFormation or AWS SAM to generate an editable diagram
- Synchronize your visual application architecture with your IaC and vice versa
- Collaborate, Deploy, Iterate



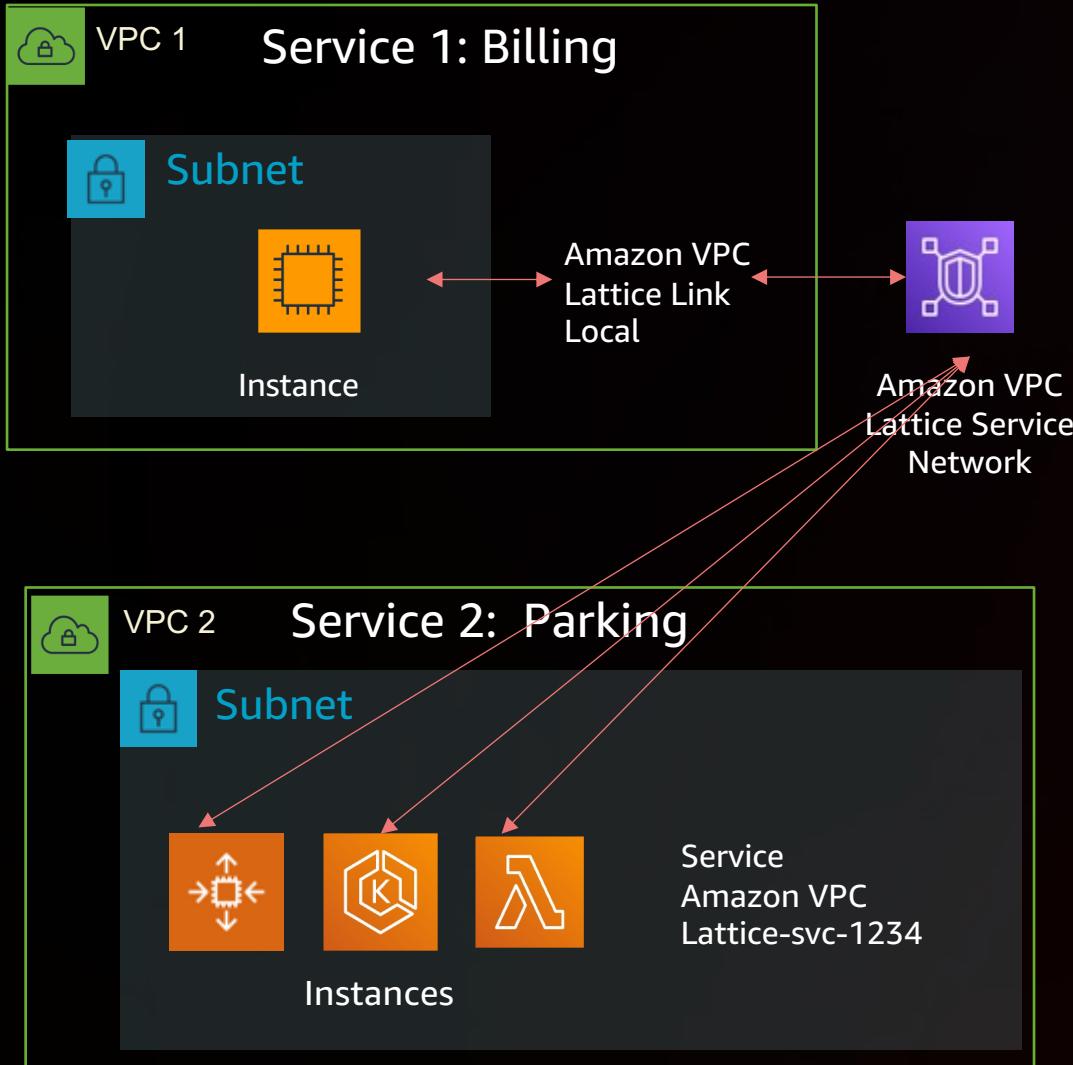
Network and Security



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Amazon VPC Lattice

SERVICE AWARE NETWORKING TO SIMPLIFY CONNECTING, SECURING, AND OBSERVING COMMUNICATION



Service Network

- Define logical boundary across VPCs and accounts
- Apply common access and observability policy



Service

- Unit of application
- Extends across all compute – instances, containers, serverless



Service Directory

- Centralized registry of services



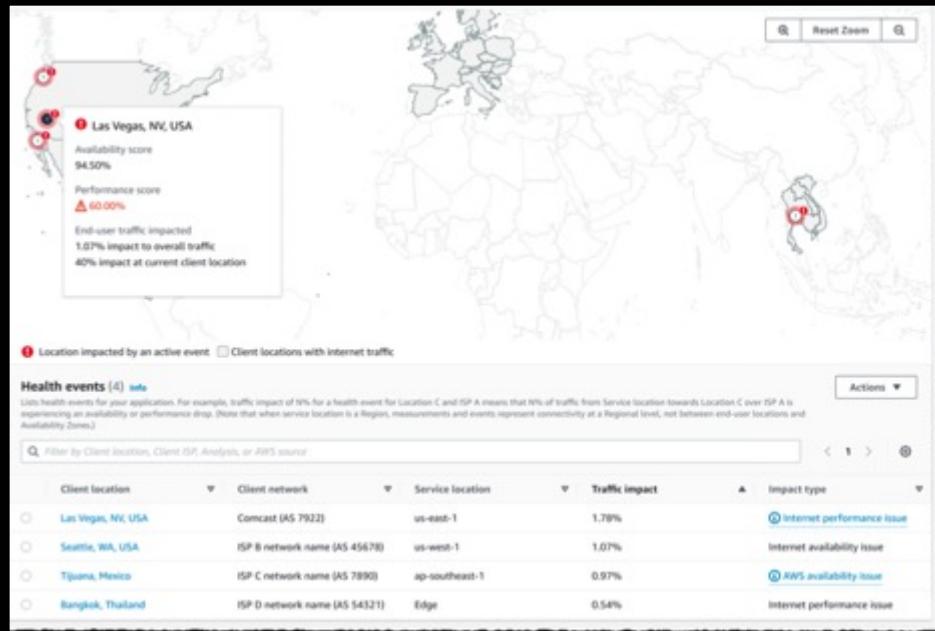
Policies

- Declarative policies for access, observability, and traffic management
- Applied at the service, gateway, or the application network level

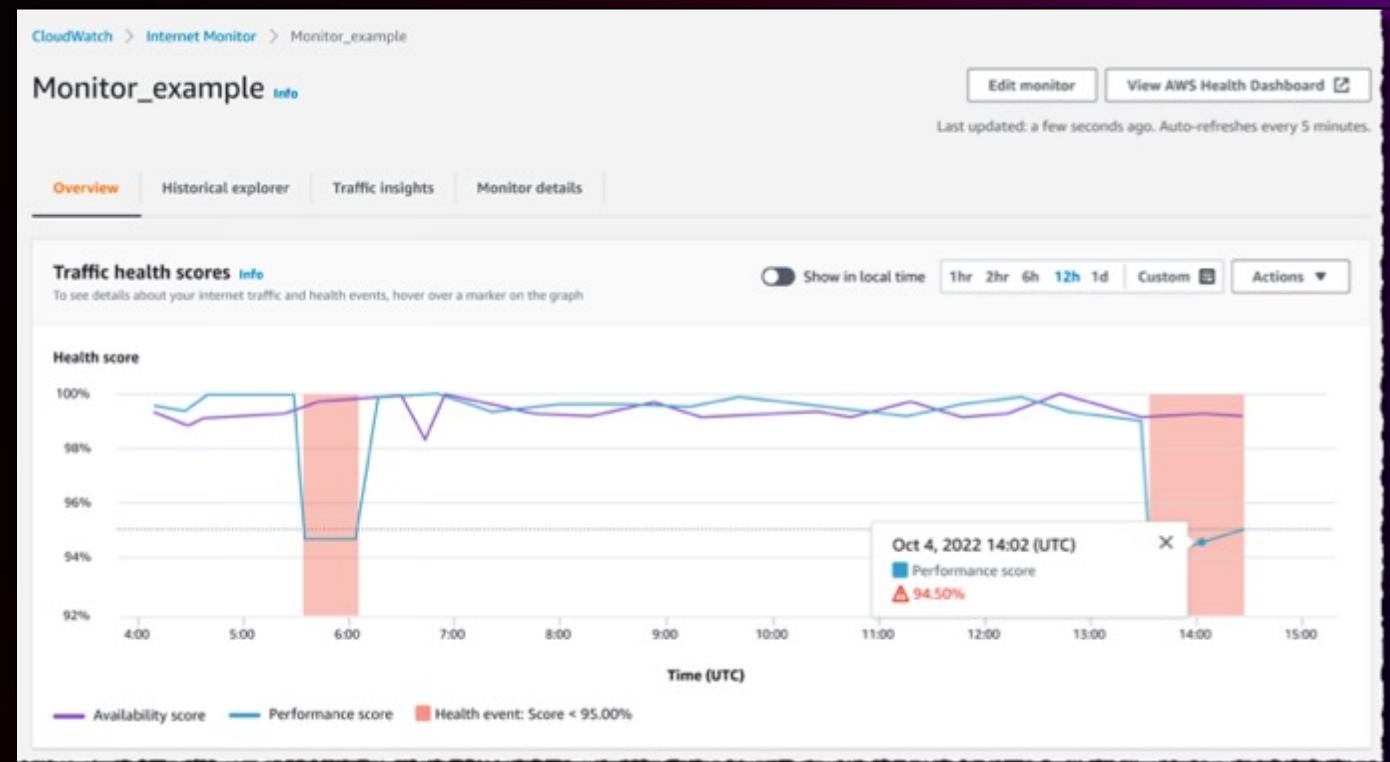


Amazon CloudWatch Internet Monitor

GET INSIGHTS INTO INTERNET HEALTH ACROSS YOUR VARIOUS ENVIRONMENTS



Uses the connectivity data that we capture from our global networking footprint to calculate a baseline of performance and availability for internet traffic



Elastic Load Balancing Updates

FOUR NEW ELASTIC LOAD BALANCING CAPABILITIES TO FURTHER IMPROVE APPLICATION AVAILABILITY

Application Load Balancer (ALB) Cross Zone Off

ALB can now disable cross zone load balancing. When enabled, ALB routes traffic to targets in the same Availability Zone (AZ) as the load balancer nodes.

ALB and NLB Minimum Healthy Targets

Customers can now configure a threshold for the minimum number or percentage of healthy targets for ALB and NLB in an AZ. When the healthy target capacity drops below the specified threshold, the load balancer automatically stops routing to targets in the impaired AZ.

NLB Health Check Improvements

NLB allows customers to define health check intervals, specify HTTP response codes that determine target health, and configure the number of consecutive health check responses before a target is either healthy or unhealthy.

Zonal Shift for ALB and NLB

Using Amazon Route 53 Application Recovery Controller's zonal shift feature, you can recover from gray failures, like bad application deployments, by routing traffic away from a single impaired AZ.



AWS Global Infrastructure Expansions

AS CUSTOMERS DEMAND MORE RESOURCES IN REGIONS AND CLOSER TO POPULATIONS, WE BUILD

AWS Regions



- Asia Pacific (Hyderabad) ap-south-1
- Europe (Spain) eu-south-2
- Europe (Zurich) eu-central-2

*AWS leader Matt Garman made a clear Digital Sovereignty Pledge right before reInvent.
Search for “AWS Digital Sovereignty Pledge:
Control without compromise”

AWS Local Zones



- Live and Existing Outside of US: Buenos Aires, Copenhagen, Delhi, Hamburg, Helsinki, Muscat, Taipei, Warsaw
- 27 more planned outside of the US
- 16 Live inside the US Already

AWS Outposts



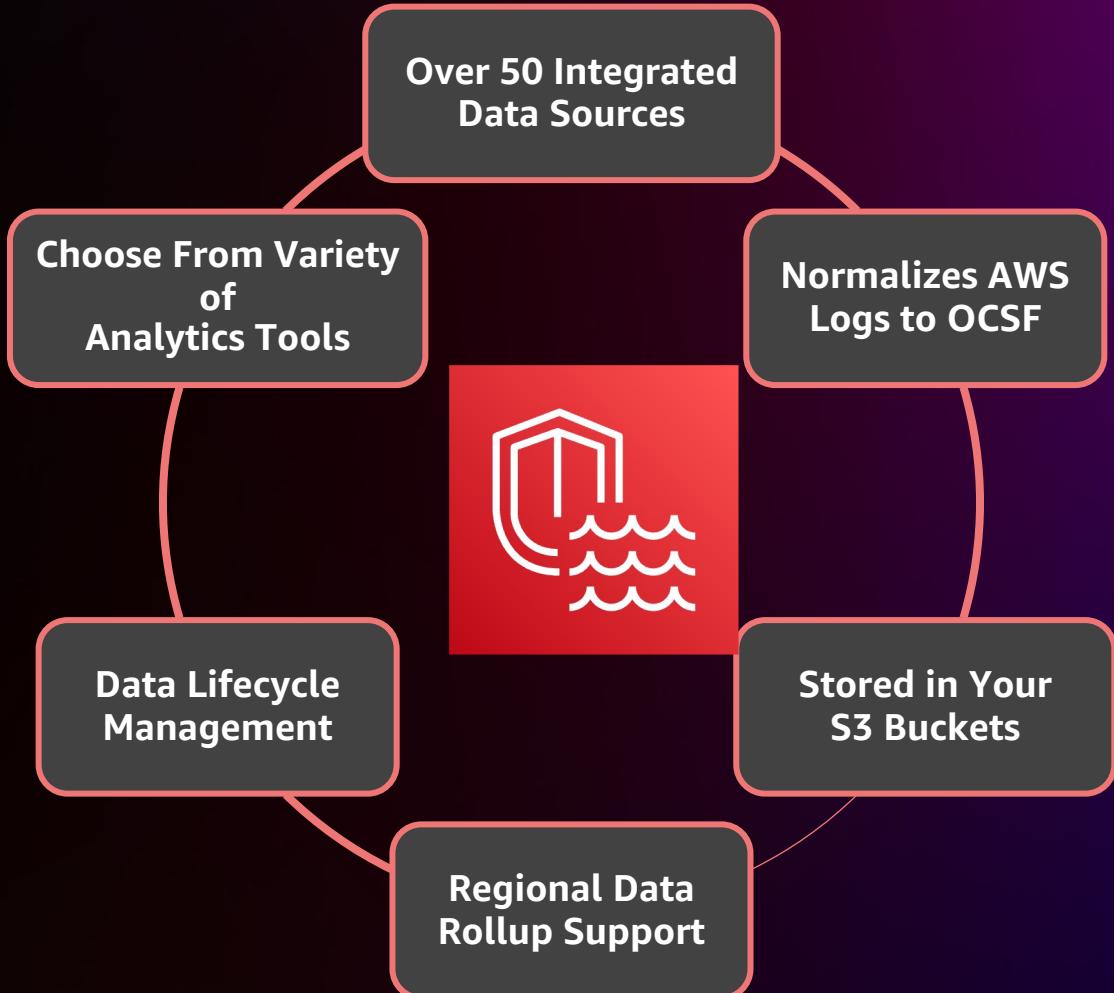
Now also in:

- Qatar
- Guatemala
- Trinidad & Tobago

Amazon Security Lake

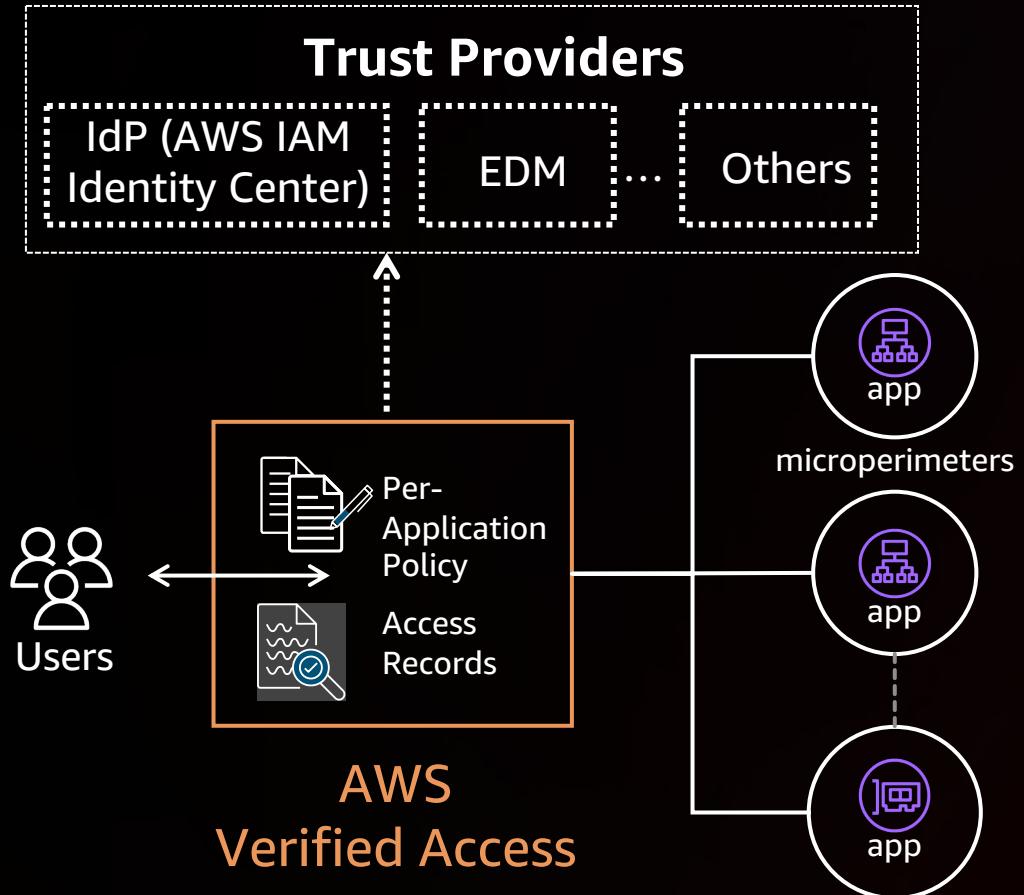
MANAGED DATA LAKE FOR SOURCING, AGGREGATING, NORMALIZING, AND QUERYING OCSF / SECURITY DATA

- **Preferred Tools:** Makes it easy for teams across your organization to access data with their preferred analytics tools, without data duplication
- **Custom Analytics:** Gives security teams broader visibility to investigate and respond to suspicious activities using your custom analytics models
- **On-Demand:** Builds a petabyte-scale data lake to support security investigations and rapid incident response scenarios
- **Unified History:** Centralizes years of cloud, on-premises, and custom data in your S3 buckets, and use your preferred tools for security analytics



AWS Verified Access

VPN-LESS ACCESS TO CORPORATE APPLICATIONS WITH GRANULAR ACCESS AND CONTROL



Build a microsecurity perimeter around corporate applications

- Single policy enforcement point for Simplified zero trust operations for IT admins
- Fine-grained, dynamic authorization where Per-application policy is evaluated with every request
- Improve observability with faster incident response and auditability, plus help meet compliance
- Use your existing security services using integration with popular identity and device trust providers

Amazon Verified Permissions

SIMPLIFY AND STREAMLINE FINE-GRAINED PERMISSIONS AND AUTHORIZATION FOR APPS

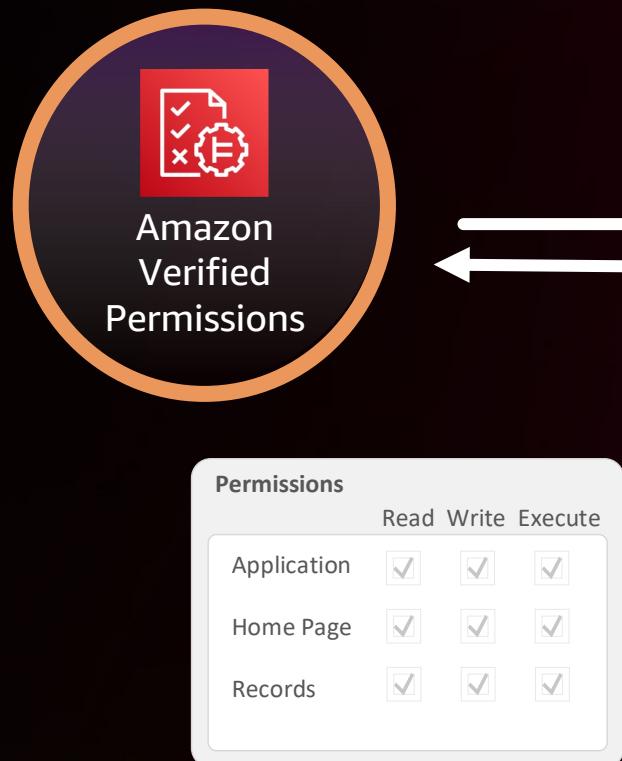
Works with existing identity providers, Cognito, API Gateway, AppSync, and Lambda to simplify App Access

User access and modification of data is controlled with a simplified Cedar Language

Policy based access control (PBAC) for applications to give users access to data and permissions

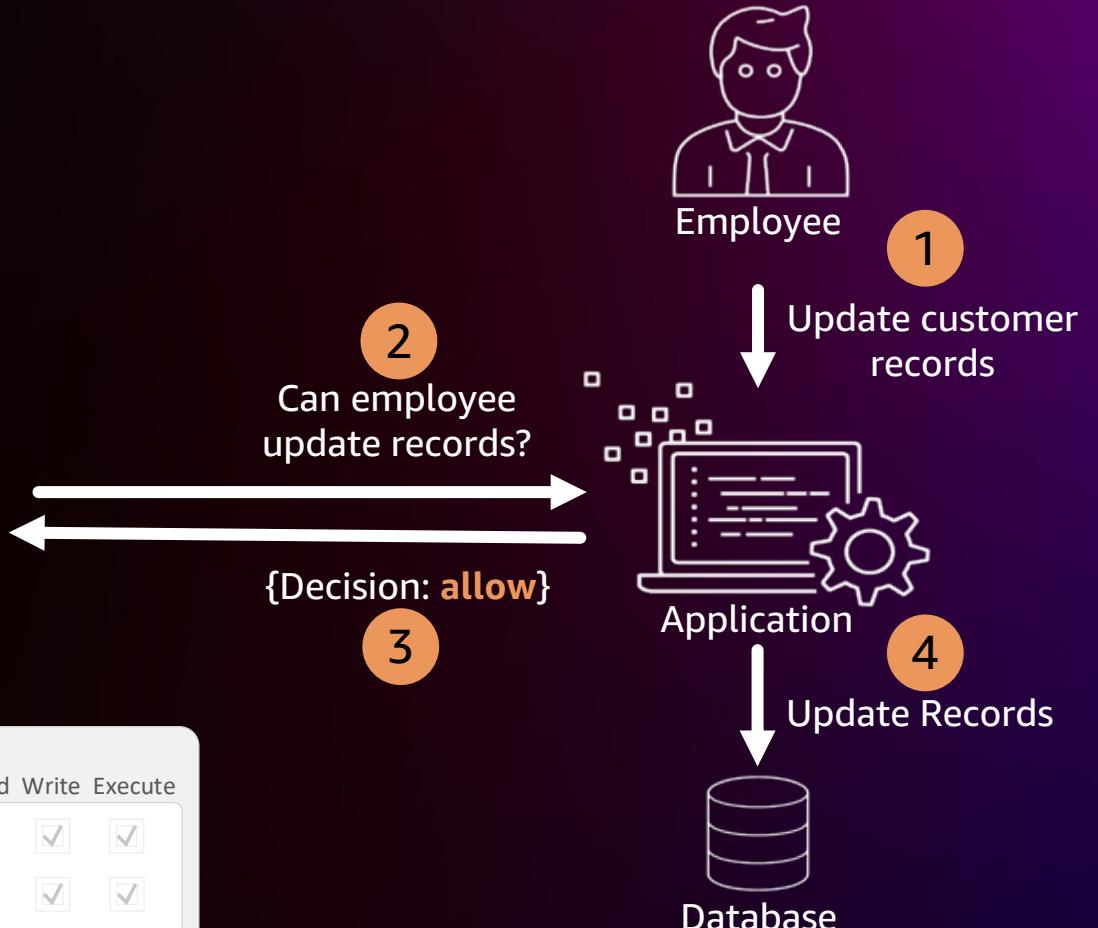
```
1 permit(  
2     principal in Usergroup::"SalesTeam",  
3     action in Action::"Maintain",  
4     resource in AccountData::"Customers")  
5 when {  
6     principal == resource.Owner ||  
7     principal.Role.contains("Manager")  
8 } ;  
9
```

Role based
Attribute based



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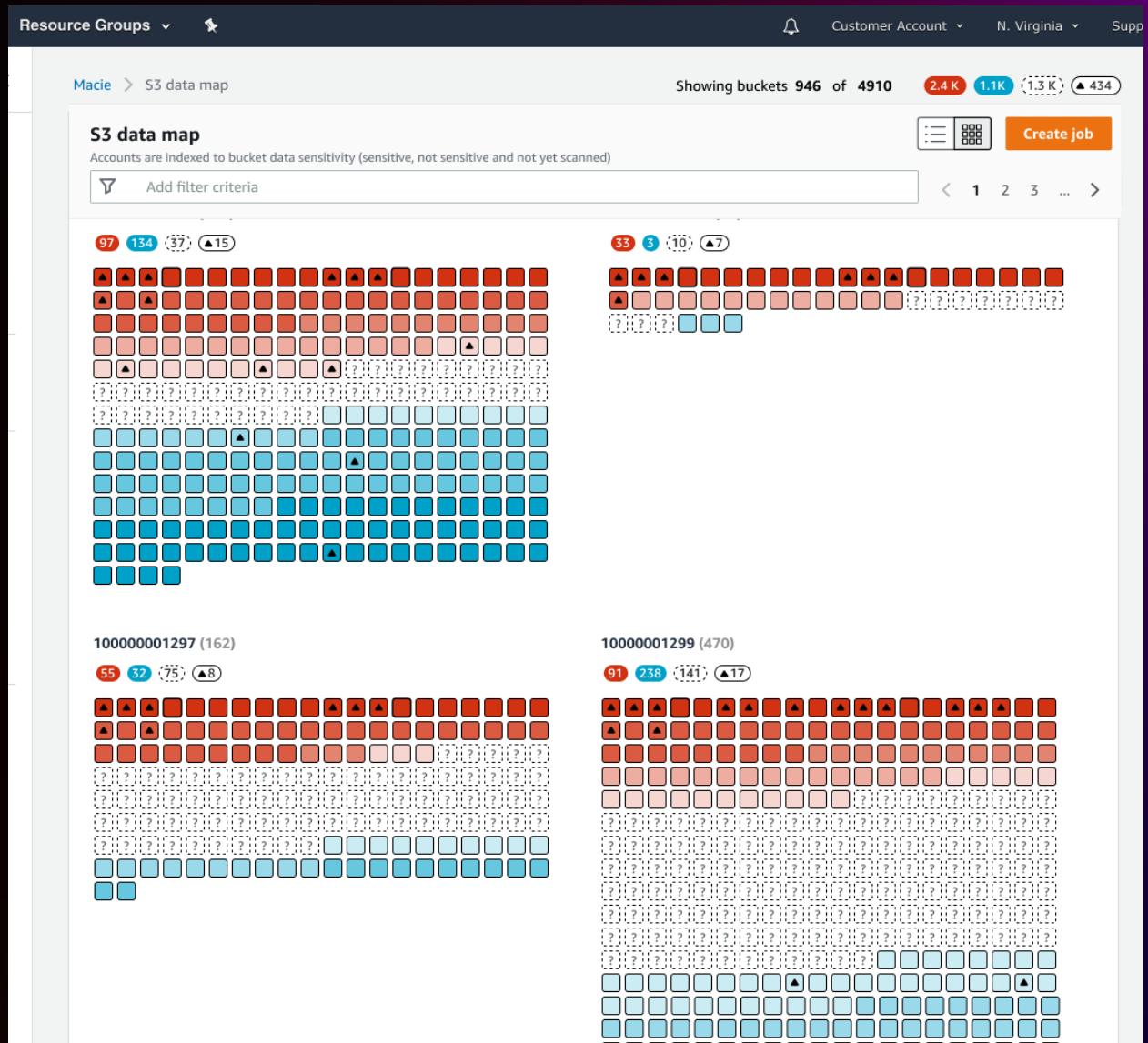
Easy to Use UI



Amazon Macie – Automated Data Discovery

CONTINUOUS ORGANIZATION WIDE VISIBILITY INTO SENSITIVE DATA

- Now gain cost-efficient and broad visibility into sensitive data stored in Amazon S3 across each AWS Account
- Macie automatically samples and analyzes objects in your S3 buckets, inspecting them for sensitive data (such as PII) and builds an interactive heat map
- Guide your decisions to perform targeted investigations of specific S3 buckets



Other Announcements



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Just Walk Out Technology by Amazon

FRiction-less, CHECKOUT-less SHOPPING EXPERIENCE

- Consumers enter a Just Walk Out powered store at a gate
- Register with credit card or app based QR code
- Or contact-less identity with Amazon One palm recognition
- Technology recognizes selected items and put in virtual cart
- Credit Card is charged when they leave the store



Water+ Water Positive by 2030

AWS WILL RETURN MORE WATER THAN WE USE IN OUR DATA CENTER OPERATIONS IN 8 YEARS



Water Efficiency

We use cloud technologies such as internet of things to analyze real time water use and identify leaks.

Sustainable Sources

AWS uses sustainable water sources, such as recycled water and harvested rainwater, wherever possible.

Water Replenishment

AWS invests in water replenishment projects in the communities where we operate.

Water Reuse in Communities

Discharged water from our data centers is still safe for many other uses.

Community Announcements

PARTNER CERTIFICATIONS TO ACCELERATE YOUR JOURNEY AND COMMUNITY ENGAGEMENT

- Amazon EC2 Spot Ready Partners
- AWS Graviton Delivery Partners
- AWS Glue Delivery Partners
- Amazon SageMaker Ready Partners
- AWS Conversational AI Competency Partners
- Amazon Managed Streaming for Apache Kafka (MSK) Delivery Partners
- AWS Builder ID and re:Post Linked logins in AWS re:Post



Summary



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Next Steps

- Follow up on items of interest
- Top Announcements of AWS re:Invent 2022
- Catch up on Keynotes and Leadership Sessions
- Stay tuned for Breakout Sessions



Thank you

Presenter Name

Role & Team
Email Address



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Appendix

Another 50 slides that might be contextually relevant



Amazon EKS Direct Deploy

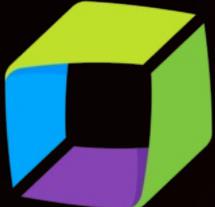
SIMPLIFYING EKS CLUSTER SETUP AND THIRD PARTY APP INSTALL

- Easily find, procure, and deploy third party software on EKS
- All the benefits of AWS Marketplace purchasing
- Streamlined deployment as add-ons



kubecost

Teleport



EKS > Clusters > channy-eks > Add add-ons

Step 1
Select add-ons

Step 2
Configure selected add-ons settings

Step 3
Review and add

Select add-ons

Review the add-ons from multiple categories, then select add-ons to enhance your cluster.

Amazon EKS add-ons (4) [Info](#)

Amazon VPC CNI Info Enable pod networking within your cluster. Category: networking	kube-proxy Info Enable service networking within your cluster. Category: networking	CoreDNS Info Enable service discovery within your cluster. Category: networking
--	--	--

AWS Marketplace add-ons (1)

Discover, subscribe to and configure EKS add-ons to enhance your EKS clusters.

Q: **kubecost**

Filtering options

Any category ▾ Any vendor ▾ Any pricing model ▾ Clear filters

kubecost **Kubecost - Amazon EKS cost monitoring**
Gain visibility into your Kubernetes resources to optimize your spend and allocate more effectively [Product details](#)

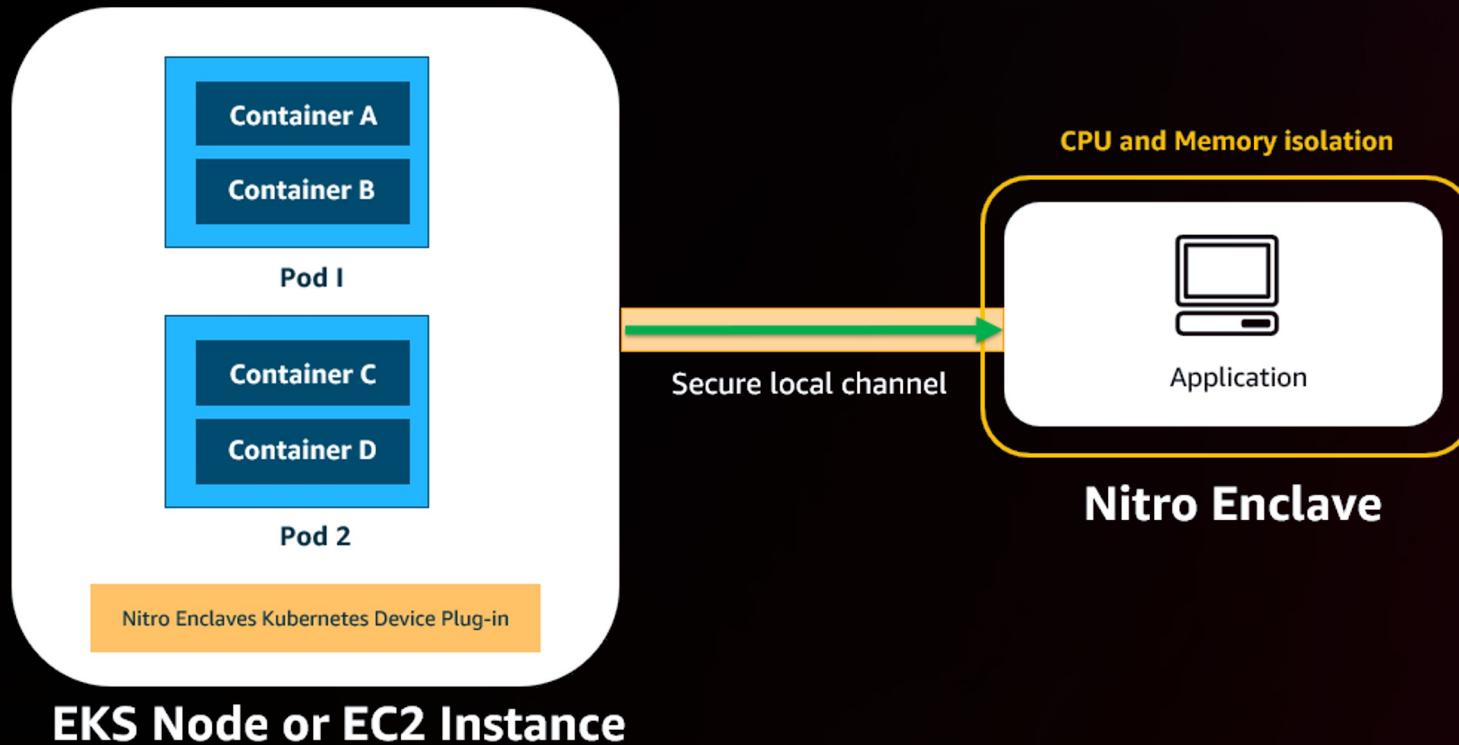
Category: cost-management	Listed by: Kubecost	Supported versions: 1.22, 1.21, 1.20	Pricing starting at: View pricing details
---------------------------	---------------------	--------------------------------------	---



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Amazon EKS Nitro Enclave Device Driver

SIMPLIFYING SETUP OF SECURE ENCLAVES FOR PROCESSING OF HIGHLY SENSITIVE DATA



- Enable pods and containers to access Nitro Enclaves on the EKS node for secure processing of sensitive data
- Ability to create and terminate Enclaves from your pods for lifecycle management
- New tooling, `enclavectl`, to simplify the build process for enclave-enabled clusters and applications

Amazon Braket Algorithm Library

A QUANTUM LEAP IN TIME TO MARKET LEVERAGING READY-TO-USE ALGORITHMS

The screenshot shows the Amazon Braket Algorithm Library interface. On the left, a sidebar menu includes options like Dashboard, Devices, Notebooks, Jobs, Tasks, and Algorithm library (which is currently selected). The main content area displays a catalog of pre-built quantum algorithms written in Python. The algorithms listed are Bernstein-Vazirani Algorithm, Deutsch-Jozsa Algorithm, Grover's Search, and Quantum Approximation. Each algorithm card includes a GitHub icon, a brief description, and a 'Tags' section. A search bar at the top allows filtering by algorithm name. An orange 'Open notebook' button is located in the top right corner of the main content area.

Save time and money for your
Quantum Algorithm Developers

The screenshot shows a Jupyter Notebook titled 'jupyter Simons_Algorithm Last Checkpoint: 4 hours ago (autosaved)'. The notebook interface includes standard buttons for File, Edit, View, Insert, Cell, Kernel, Widgets, Help, and various cell types. A user profile icon and 'Logout' link are visible in the top right. The main content of the notebook is titled 'Simon's Algorithm' and describes the execution of Simon's algorithm on Amazon Braket. It includes mathematical notation for the function $f : \{0, 1\}^n \rightarrow \{0, 1\}^n$ and the goal of finding the secret string s . Below this, a 'References' section lists three sources: Wikipedia, SIAM, and the Amazon Braket GitHub repository. A 'Run on a local simulator' section contains a code cell with Python code for importing numpy.random, AwsDevice, LocalSimulator, and Tracker from the braket library.



Application Migration Service

MAJOR UPDATES TO ALIGN WITH STANDARD MIGRATION PATTERNS AND SIMPLIFY TEMPLATES

Grouping Servers into Applications and Waves

The screenshot shows the 'Applications' section of the AWS Application Migration Service console. On the left, a sidebar lists 'Source servers', 'Applications' (8), 'Waves' (4), 'Launch history', and 'Settings'. The main area displays a table titled 'Applications (8)'. The table includes columns for 'Application name', 'Wave name', 'Migration status', 'Alerts', and 'Number of servers'. The data shows four applications: 'Internal Web Application' in 'Test Wave' (Completed, Healthy, 3 servers), 'SAP-based ERP Application' in 'Critical Wave' (Completed, Healthy, 2 servers), and 'HR Applications' in 'Critical Wave' (Completed, Healthy, 3 servers). Below the table, tabs for 'Replication template', 'Launch template', 'Post-launch template', and 'User preferences' are visible. A note states: 'Every source server added to this service has post-launch settings that control actions performed after the server is launched in AWS. These settings are created automatically based on this template, and can be modified for any source server. The default template can be modified at any time.' A message box says: 'Changes made to the templates will only be applied to newly added servers.'

Updated Post-Launch Template

The screenshot shows the 'Custom actions' section of the AWS Application Migration Service console. The table lists two actions: 'CopySnapshot' and 'ApplyAnsiblePlaybooks', each associated with a document named 'AWS-' followed by the action name. The 'Order' column shows values 1001 and 1002 respectively. Below the table, a search bar with placeholder 'Find actions' is visible.

Updated Launch Template

The screenshot shows the 'Settings' page of the AWS Application Migration Service. The 'Launch template' tab is selected. A note states: 'Every source server added to this service has launch settings that control actions performed after the server is launched in AWS. These settings are created automatically based on this default launch template, and can be modified for any source server. The default can be modified at any time.' A message box says: 'Changes made to the templates will only be applied to newly added servers.' Below this, the 'General launch settings' section is shown, with options for 'Instance type right sizing' (On), 'Start instance upon launch' (Yes), 'Copy private IP' (No), 'Operating system licensing' (License-included), and 'Transfer server tags' (Yes).

Default EC2 Launch Template

Configure the default settings that will be applied to the EC2 launch template of every target server.

Template ID	lt-06614609424bdcc50	Default target subnet	-
Instance type	-	EBS volume type	General Purpose SSD (gp3)
Security groups			



Compute Savings Partner Announcements

NEW PARTNERSHIPS TO ACCELERATE YOUR COMPUTE SAVINGS INITIATIVES

AWS Compute Optimizer External Metrics



AWS Compute Optimizer

Amazon EC2 Spot Ready Software

Find Amazon EC2 Spot Partners

Filter by:

- Clear all filters
- Offering Type
 - Software
- Categories
 - Business Applications
 - Data and Analytics
 - Developer Tools
 - Infrastructure Software
 - Internet of Things
 - AI & Machine Learning
 - Migration
 - Media and Entertainment
 - Financial Services
- Headquarters
 - Asia Pacific
 - China
 - Europe, Middle East, and Africa

Search: 1-6 (10)

AWS PARTNER	Offerings	Actions
ActionIQ	ActionIQ CDP	Learn more Contact AWS Marketplace
CircleCI	CircleCI	Learn more Contact
CloudBees	CloudBees CI	Learn more Contact AWS Marketplace
Databricks	Databricks Delta Lake Data Platform	Learn more Contact
Harness	Harness Dev Ops CI/CD	Learn more Contact
Incredibuild	Incredibuild Build System	Learn more Contact



Microsoft Office AMIs

LICENSE INCLUDED MICROSOFT OFFICE FOR COMPLIANT OFFICE IN THE CLOUD



Office LTSC Professional Plus

By: [Amazon Web Services](#) Latest Version: 1.3

Office LTSC Professional Plus 2021 gives you the tools to get work done with updated versions of Word, Excel, PowerPoint, Outlook, Access, Publisher, and Teams.

Windows

- Microsoft Office LTSC Professional Plus 2021 AMIs
- Flexibility to modify end user access on a monthly basis
- Compute capacity is per vCPU for the Windows Server instance
- Microsoft Office and Remote Desktop Services Subscriber Access Licenses per-user per-month

Amazon GameLift Anywhere

FLEXIBLE COMPUTE FOR RUNNING GAME SESSIONS BOTH INSIDE AND OUTSIDE THE CLOUD

AWS EC2
(Fully-managed)



AWS Compute
(EKS, ECS, & more)



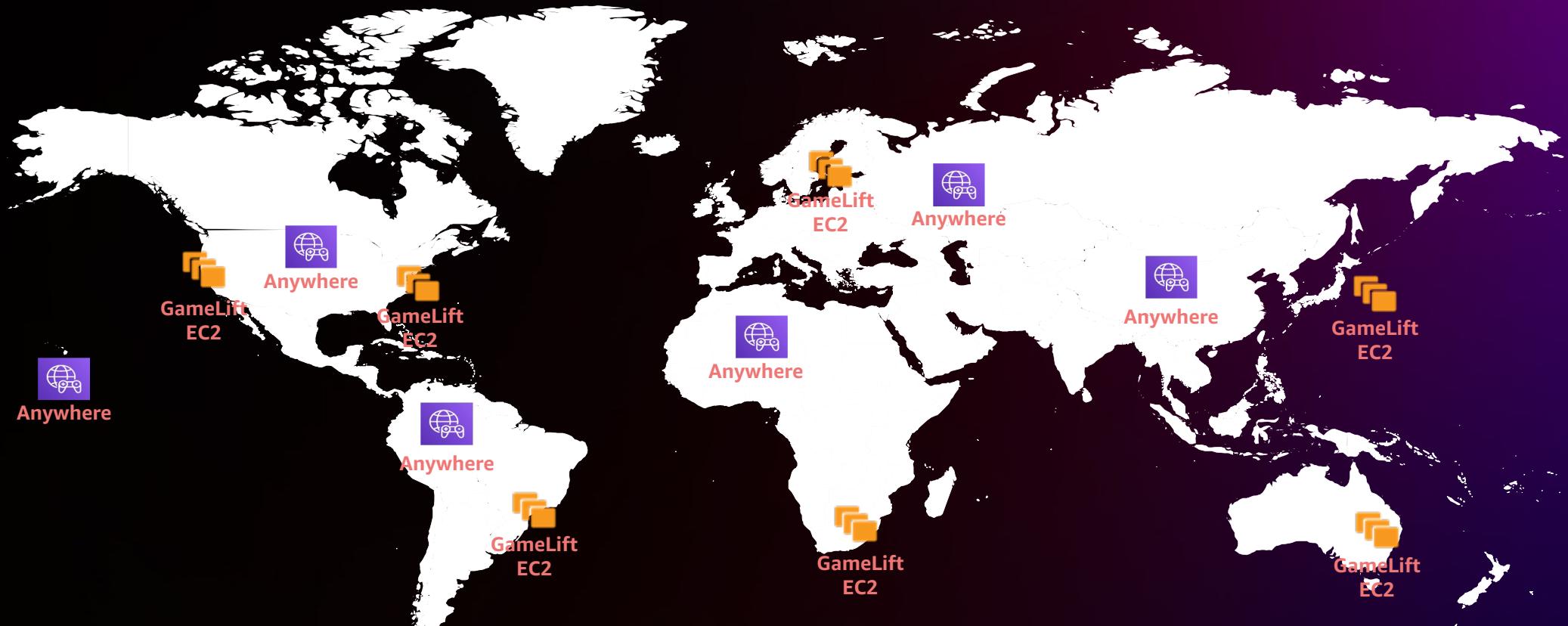
On-Premises



Co-Location



Bare-Metal

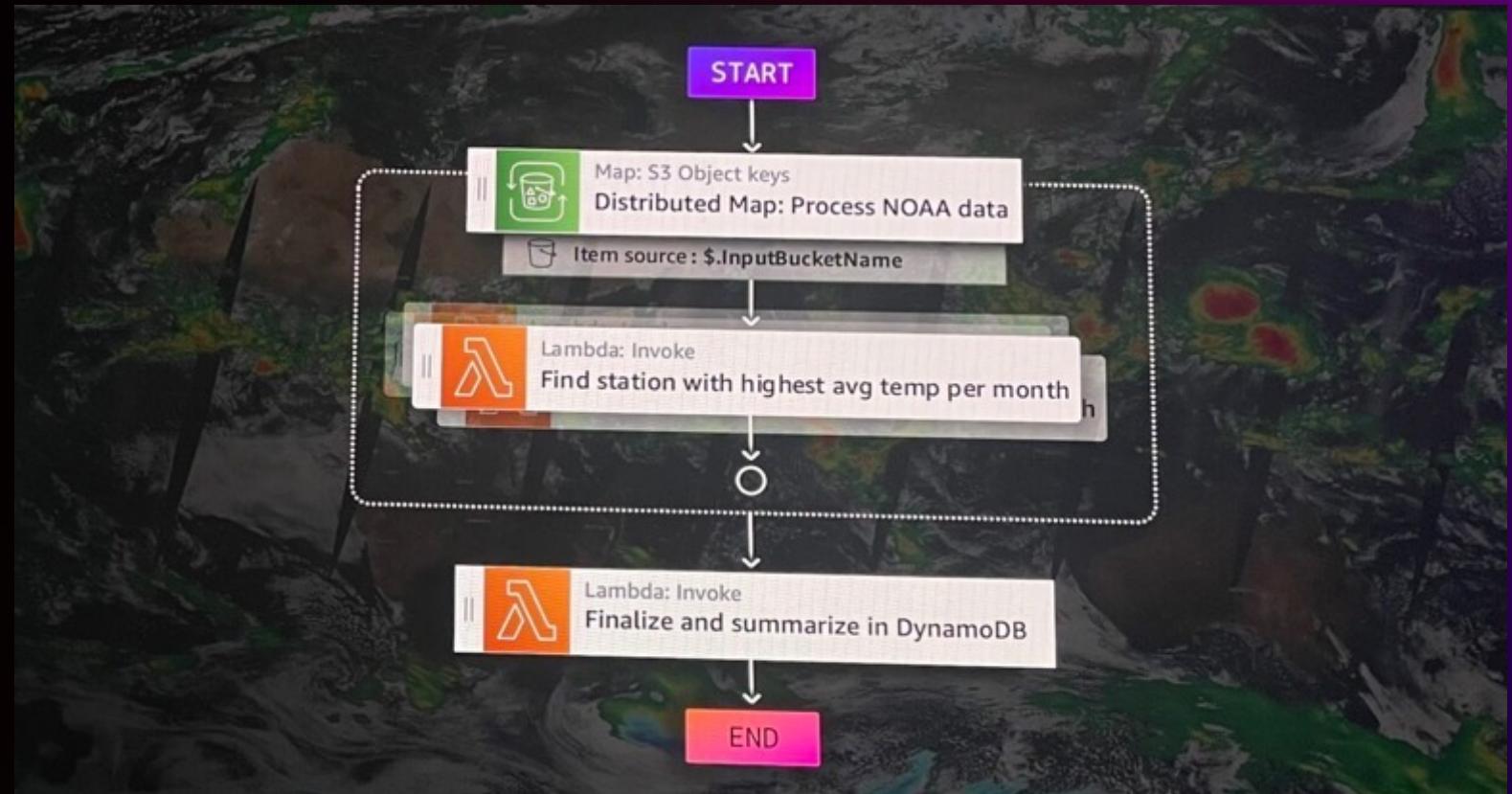


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Step Functions Distributed Map

SERVERLESS SOLUTION FOR ORCHESTRATING LARGE-SCALE PARALLEL DATA PROCESSING

- Run sub-workflow for each item
- Process millions of items
- Up to 10,000 concurrent executions
- Both Standard and Express workflows
- Same or lower cost compared to in-line maps in current workflows



AWS AppConfig Container Agent

AUTOMATIC RETRIEVAL AND CACHING OF APPLICATION FEATURE FLAGS AND RUNTIME CONFIGURATIONS

AWS Systems Manager > AppConfig > FlagsDemo > CheckoutFlags

CheckoutFlags

Actions ▾ Start deployment

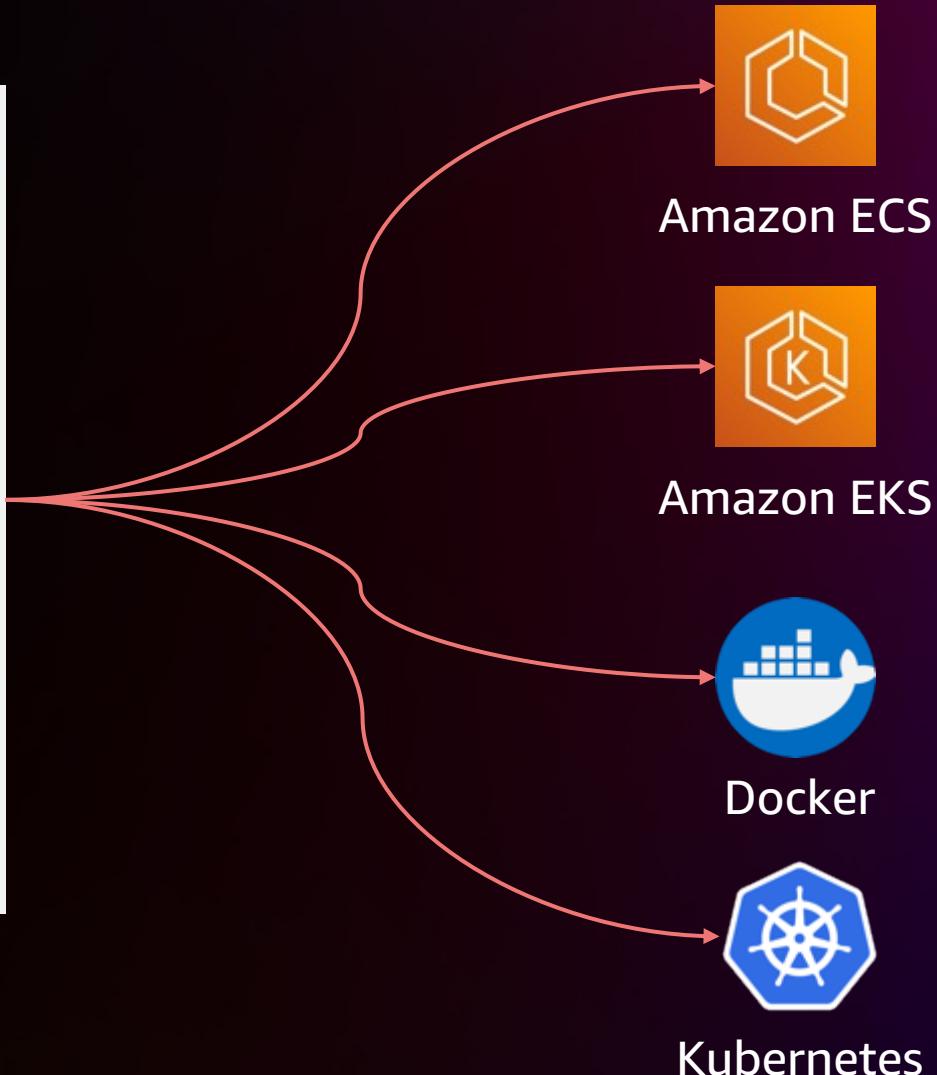
Flags (1)

Version ⓘ 1 Delete version Save new version

allow-bitcoin-at-checkout (allow-bitcoin-at-checkout)

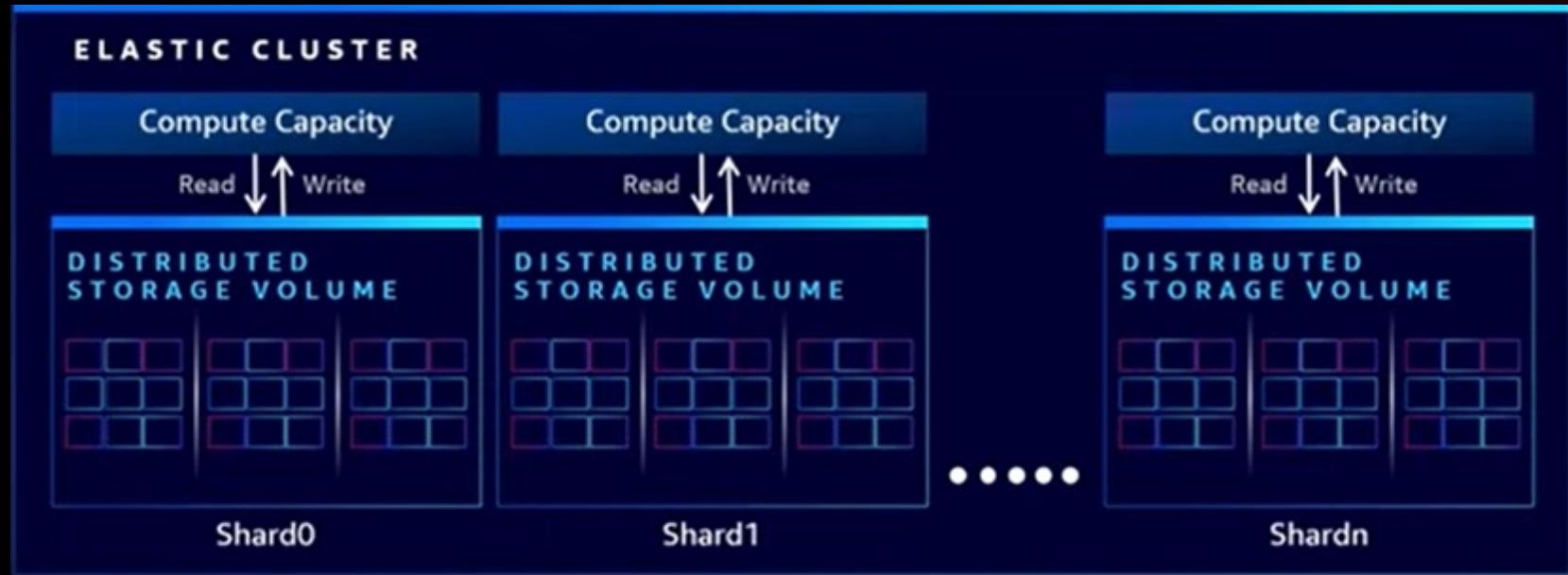
Edit Delete

Attribute Key	Type	Value
bitcoin-discount-end-date	String	06/05/2022
bitcoin-discount-percentage	Number	5
default-currency	String	BTC



Amazon DocumentDB Elastic Clusters

FULLY MANAGED SOLUTION TO SCALE DOCUMENT WORKLOADS OF ANY SIZE AND SCALE



Elastically scale workloads in minutes

Zero impact to application availability or performance

Automatically manage underlying infrastructure

Scale to millions of writes and reads per second with petabytes of storage

Amazon Transcribe Real-time Call Analytics

MACHINE LEARNING BASED CALL ANALYTICS TO MEASURE SENTIMENT AND ASSIST AGENTS

- Analyze calls in real-time
- Identify customer experience issues and sentiment
- Real-time transcript of the live conversation
- Agents can focus their full attention on engaging with the customer
- Proactively assist agents with relevant information or alert supervisors about emerging issues

The screenshot displays the Amazon Transcribe Call Analytics interface. At the top, a navigation bar shows 'Call Analytics > Calls'. Below it, a table titled 'Calls (4) Info' lists four recent calls. The columns include Call ID, Agent, Initiation Timestamp, Caller Phone, Status, Caller Sentiment, Caller Sentiment Score, Duration, and Categories. The first call is from BobS at 2022-11-22T20:56:56.220Z, status Done, Positive sentiment, Up score, duration 00:00:54, and category HowCanHelp. The second call is from BobS at 2022-11-22T20:55:33.217Z, status Done, Neutral sentiment, Down score, duration 00:01:07, and categories ManagerEscalation and ManagerEscalation. The third call is from ChrisL at 2022-11-22T20:54:07.790Z, status Done, Negative sentiment, Flat score, duration 00:00:46, and categories ManagerEscalation and HowCanHelp. The fourth call is from 630bc60a-f214..., status Pending.

Below the table, a large panel shows a 'Transcription output' of a call between a customer and an agent. The transcription includes a turn-by-turn transcript with timestamps, sentiment emojis, and category detection. A 'Category detected: Escalation' callout appears over the customer's message: 'Yeah, I'm calling about my insurance policy. Um, I just received a notice in my insurance has been cancelled.' The 'Call characteristic' panel indicates this is an 'ISSUE DETECTED'. Another 'Category detected: Escalation' callout appears later in the transcript. To the right, an 'Implementation details' section provides a summary of API operations and parameters used.



Amazon Redshift Access Control Features

RBAC, COLUMN, AND ROW LEVEL SECURITY CAN NOW ALSO CONSIDER DATA MASKING AND LAKE FORMATION

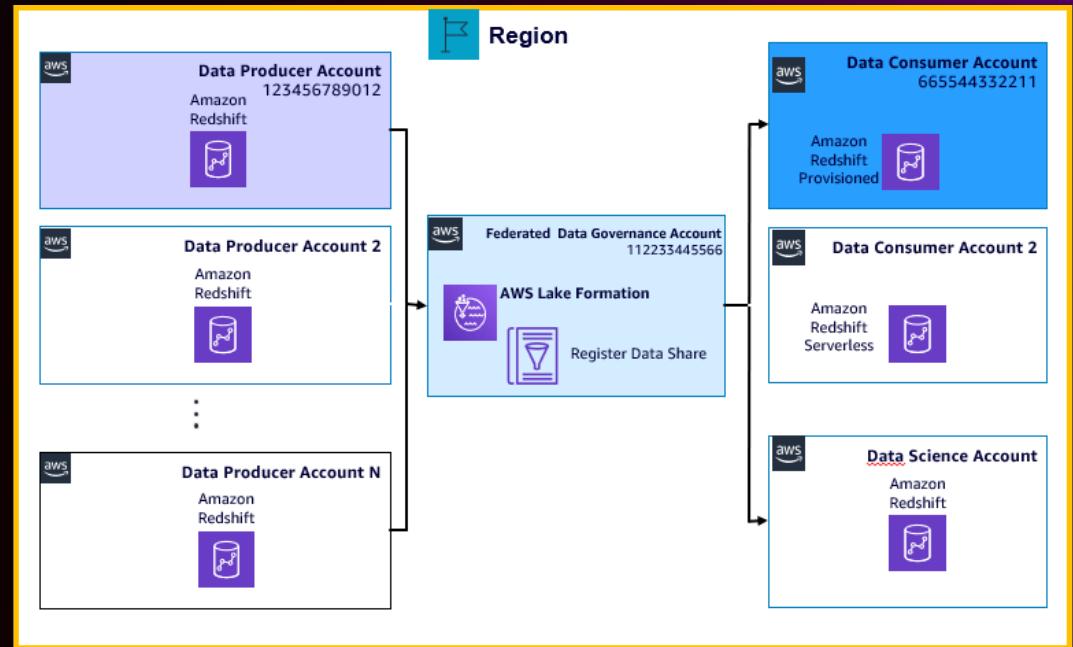
Dynamic Data Masking

- Easily protect sensitive data by managing data masking policies through a SQL interface
- Users can define the way to do the data masking
- Mask by modifying sensitive or PII data with fictitious content viable for software development, testing and analytics
- Restrict different levels of permissions to masked data with Role-Based Access Control (RBAC)

ID	Geo-location	Name	Phone number
123	WA	Ana	123-456-3568
124	NY	Alice	123-457-****
125	WA	Bruce	123-457-3569
126	CA	Chris	123-457-****
130	CA	Sharon	123-457-****

Condition column
Mask column

Centralized Access with AWS Lake Formation



Use, or extend an existing, Lake Formation to centrally manage access to Redshift data shares by registering Redshift datastores with Lake Formation and utilizing its enterprise IAM control



Amazon RDS & Amazon Aurora

IMPROVING PERFORMANCE AND AGILITY WHILE INCREASING SECURITY FOR YOUR CRITICAL DATA

RDS for MySQL Optimized Reads



RDS for MySQL Optimized Writes



Faster query processing with temp tables generated by MySQL on NVMe-based SSD block storage physically connected to the host server

Queries against temporary tables, like sorts, hash aggregations, and high-load joins can execute up to 50% faster

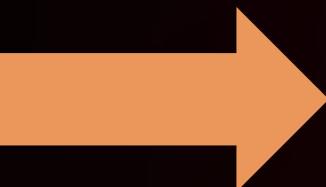
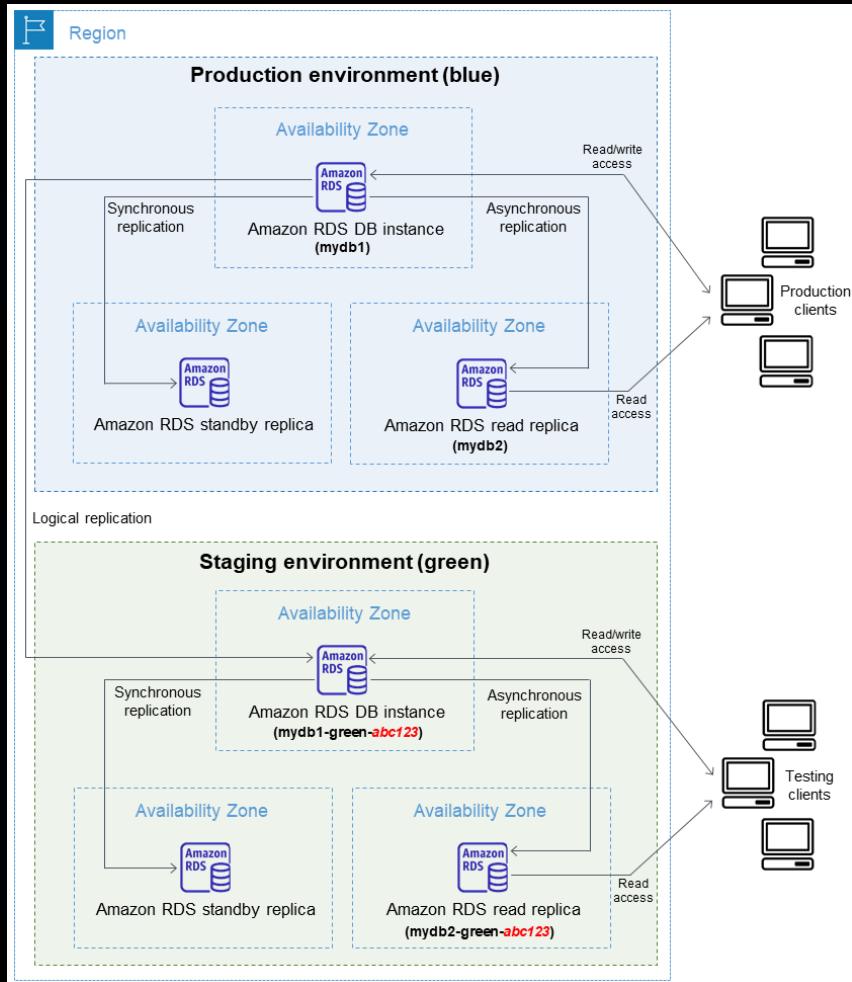
2x in write transaction throughput at no extra charge with the same level of provisioned IOPS

Designed for write-heavy workloads that generate lots of concurrent transactions.

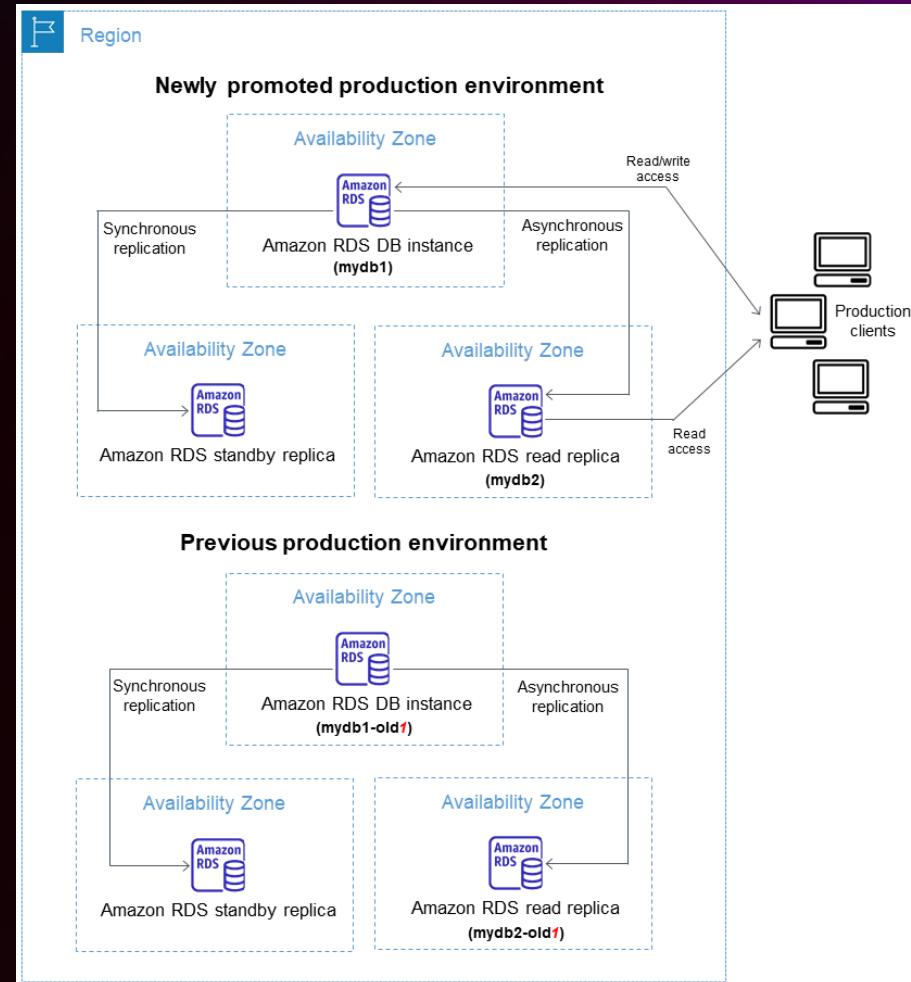
Optimized Writes uses uniform 16 KiB database pages, file system blocks, and operating system pages, then writes them to storage atomically (all or nothing) for 2x throughput

RDS and Aurora Managed Blue/Green Deployments

MODERN ENVIRONMENT PROMOTION AND TESTING CONSTRUCTS NOW MANAGED FOR RDS



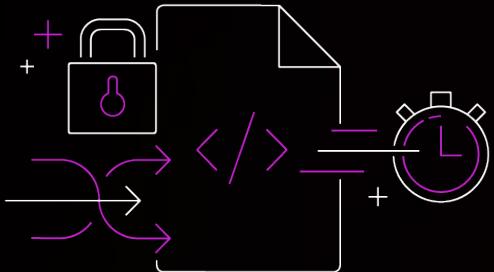
Managed
Promotion



Amazon RDS & Amazon Aurora

IMPROVING PERFORMANCE AND AGILITY WHILE INCREASING SECURITY FOR YOUR CRITICAL DATA

PostgreSQL Trusted Language Extensions



Create PostgreSQL extensions that follow the documented approach for extending PostgreSQL functionality

Can use it in environments that don't provide access to the file system underlying the PostgreSQL instance

Designed to prevent access to unsafe resources for the extensions that you create

Gives database administrators fine-grained control over who can install extensions and it provides a permissions model for running them

GuardDuty RDS Protection

Threat detection for Amazon Aurora to identify potential threats to data stored in Aurora databases

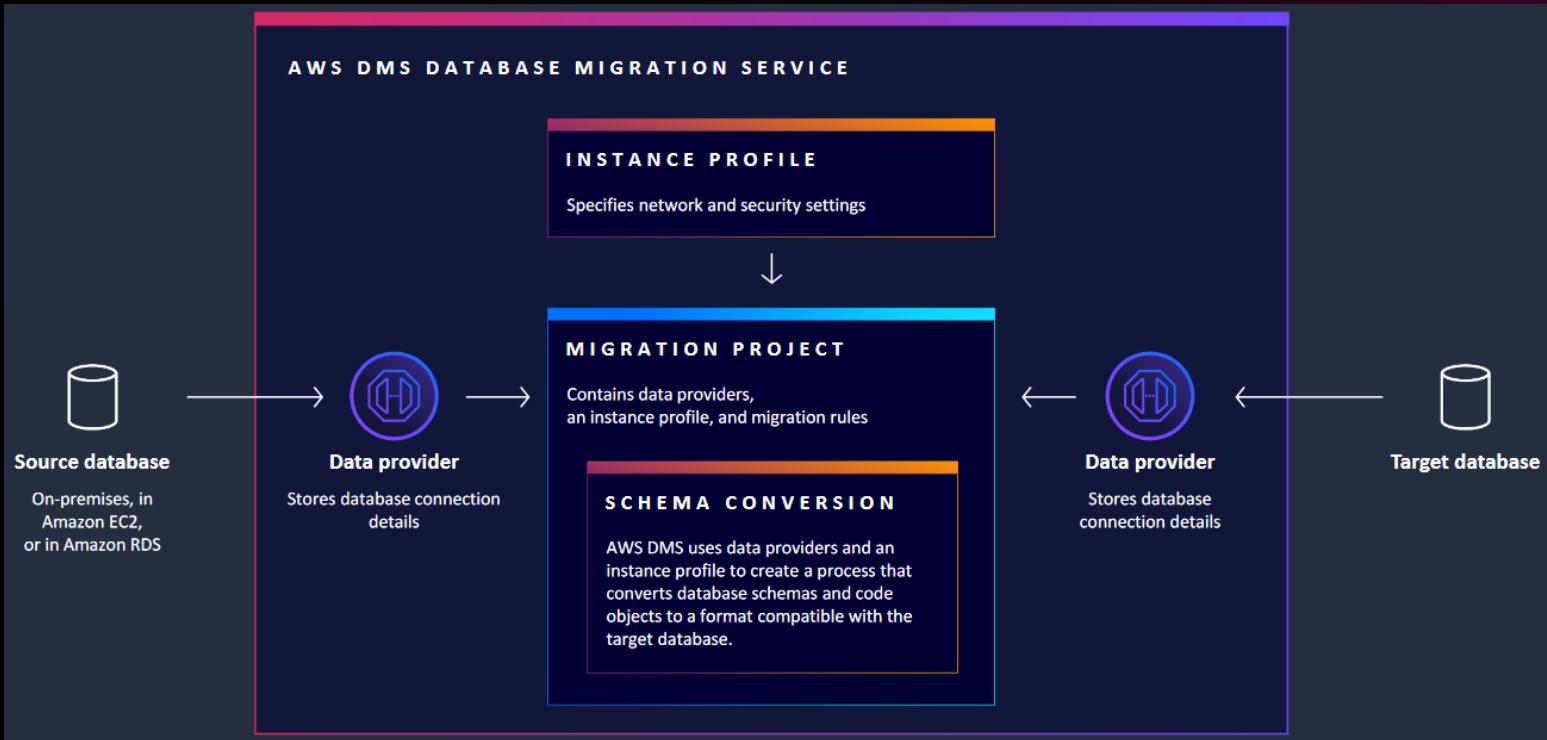
Profiles and monitors access activity to existing and new databases in your account

Uses tailored machine learning models to accurately detect suspicious logins to Aurora databases



AWS DMS Schema Conversion

A LONG AWAITED UPGRADE OF DMS PROVIDES A FULLY MANAGED CONVERSION SERVICE



Automatically converts your source database schemas and database code objects to a format compatible with the target database.

Includes tables, views, stored procedures, functions, data types, and synonyms.

Any failures are clearly marked as action items with prescriptive instructions on how to migrate to AWS manually.

Amazon S3 Cross-Account Access Points

SECURE, CROSS ACCOUNT ACCESS FOR S3 USING ACCESS POINTS



- Unique access control policies per access point
- Bucket owners retain ultimate control over data access
- Bucket owners can delegate more specific IAM-based control to access point owner



Amazon S3 Failover Controls

EXPLICIT FAILOVER AND FAILBACK CONTROLS FOR S3 MULTI-REGION ACCESS POINTS

- Designate Regions as active or passive
- Shift S3 request traffic to an alternate region within minutes
- Controlled failover and fallback

Amazon S3 > Multi-Region Access Points > jbarr-mrap-1

jbarr-mrap-1 Info

Properties | Permissions | **Replication and failover**

▼ Replication and failover overview Info
This summary was generated based on your failover status and the replication rules for the Regions that are used with this Multi-Region Access Point.

Replication **Failover**

● AWS Regions
→ One-way replication
↔ Two-way replication

Highcharts.com © Natural Earth

Edit routing status

AWS Region	Routing status
Asia Pacific (Tokyo) ap-northeast-1	<input checked="" type="radio"/> Active <input type="radio"/> Passive
Asia Pacific (Seoul) ap-northeast-2	<input type="radio"/> Active <input checked="" type="radio"/> Passive
Asia Pacific (Osaka) ap-northeast-3	<input type="radio"/> Active <input checked="" type="radio"/> Passive
Asia Pacific (Mumbai) ap-south-1	<input type="radio"/> Active <input checked="" type="radio"/> Passive
Asia Pacific (Singapore) ap-southeast-1	<input type="radio"/> Active <input checked="" type="radio"/> Passive
Asia Pacific (Sydney) ap-southeast-2	<input type="radio"/> Active <input checked="" type="radio"/> Passive

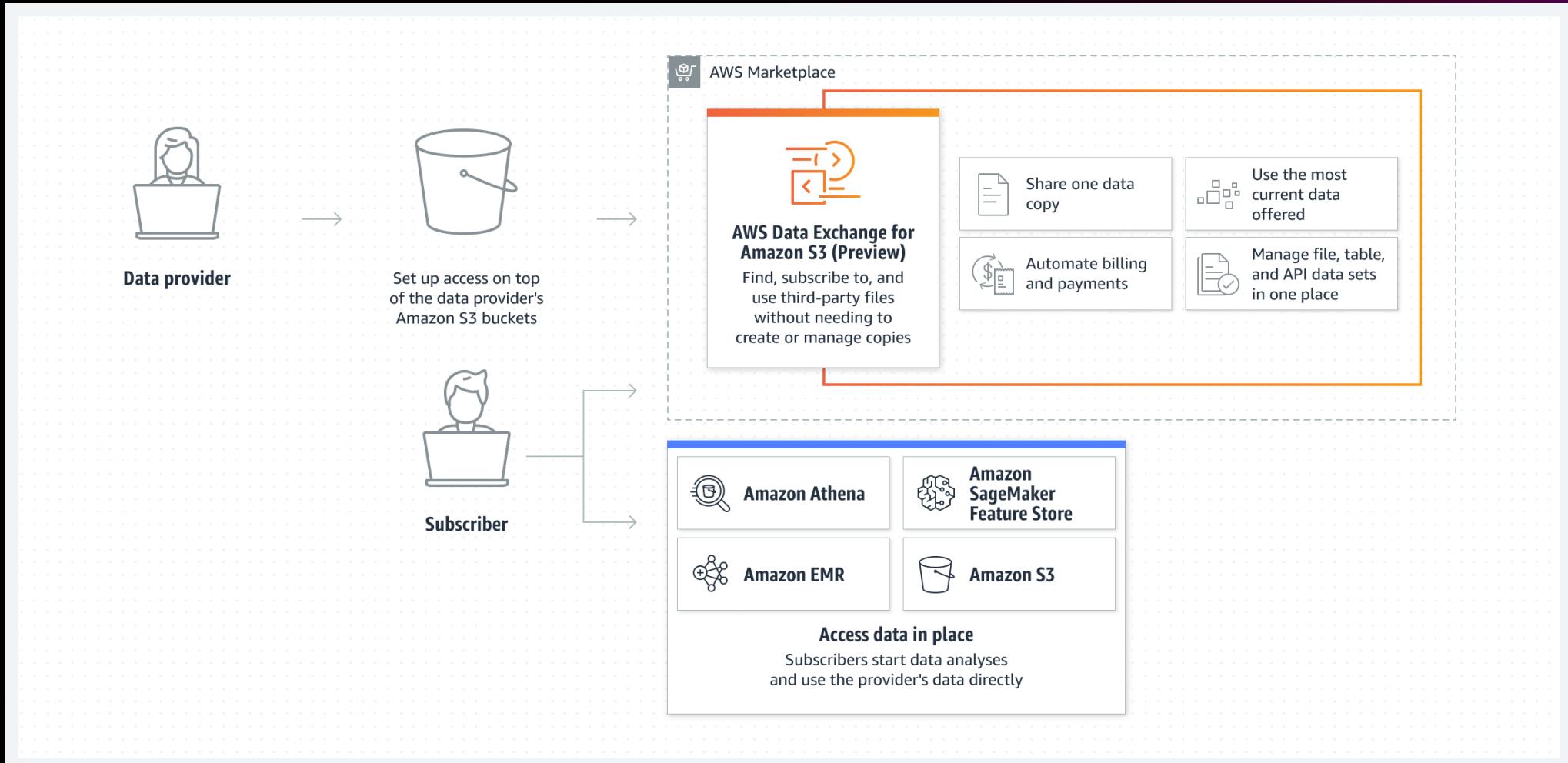
ⓘ After you've saved the routing status, it takes about 2 minutes for new traffic to be redirected.

Cancel **Save routing status**



AWS Data Exchange for Amazon S3

SIMPLY MONETIZE YOUR DATA OR SUBSCRIBE TO THIRD-PARTY DATA THROUGH AWS MARKETPLACE



AWS Backup Enhancements

EXPANDED SERVICE INTEGRATIONS, FEATURES FOR OPERATING AT SCALE, AND LEGAL COMPLIANCE

New Service Integrations



CloudFormation



Redshift

Legal Hold

Legal holds

Legal holds help preserve backups for legal and auditing purposes. Backups with legal holds cannot be deleted, and they resume their lifecycle policies after the hold is released. More than one legal hold can be added to the same backup.

▼ How legal holds work

Perform the following steps to place a legal hold.

Legal hold	Manage permissions	Add a legal hold
A legal hold prohibits designated backups from being deleted or altered, regardless of lifecycle.	Legal holds can be added and released only by users who have specific IAM permissions. To check or grant permissions, click "Manage permissions" below.	To create a new legal hold, click on the "Add legal hold" button. Then, configure the legal hold policy by selecting the backups to hold and filter the selection with a date range.
Learn more		

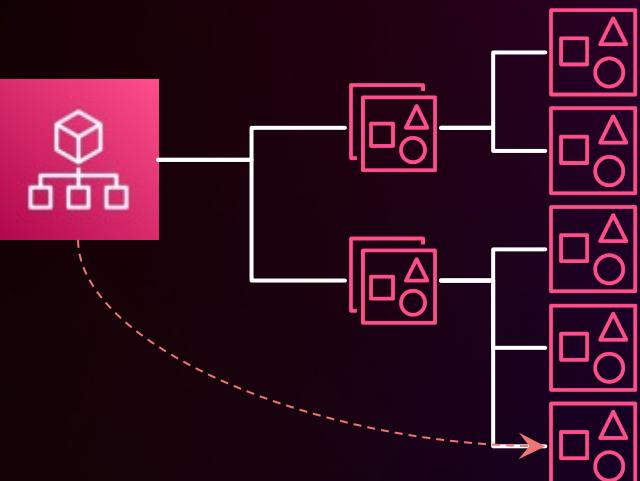


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Centralized Reporting



Organizations Delegation



FSx Enhancements

DOUBLING PERFORMANCE AND SIMPLIFYING INTEGRATION FOR THESE SPECIFIC FSX USE CASES

Amazon FSx for NetApp ONTAP



2x

Max throughput capacity
Up to 4 GB/s

2x

Max IOPS capability
Up to 160,000

Amazon FSx for OpenZFS



2x

Max throughput Capacity
Up to 10 GB/s

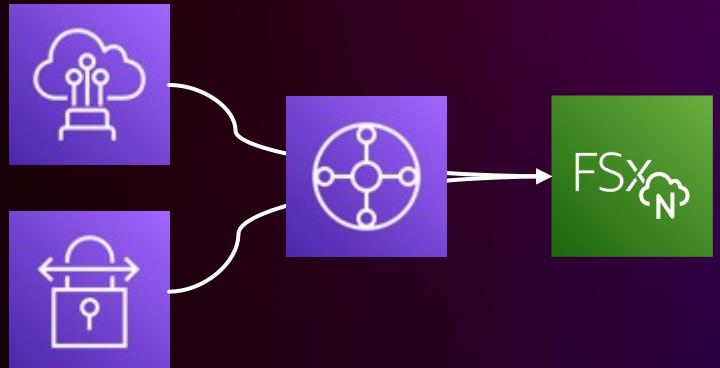
2x

Max IOPS capability
Up to 350,000

2.5TB

High-speed NVMe cache

Simplified Access for Multi-AZ FSx NetApp ONTAP File Systems



EFS Enhancements

IMPROVEMENTS AND NEW OPTIONS FOR BETTER PERFORMANCE AND MANAGING COSTS

Elastic Throughput

3 GiB/s

Max **read** capacity

1 GiB/s

Max **write** capacity

- Pay as you consume pricing
- No burst credits to monitor

Reduced Latencies

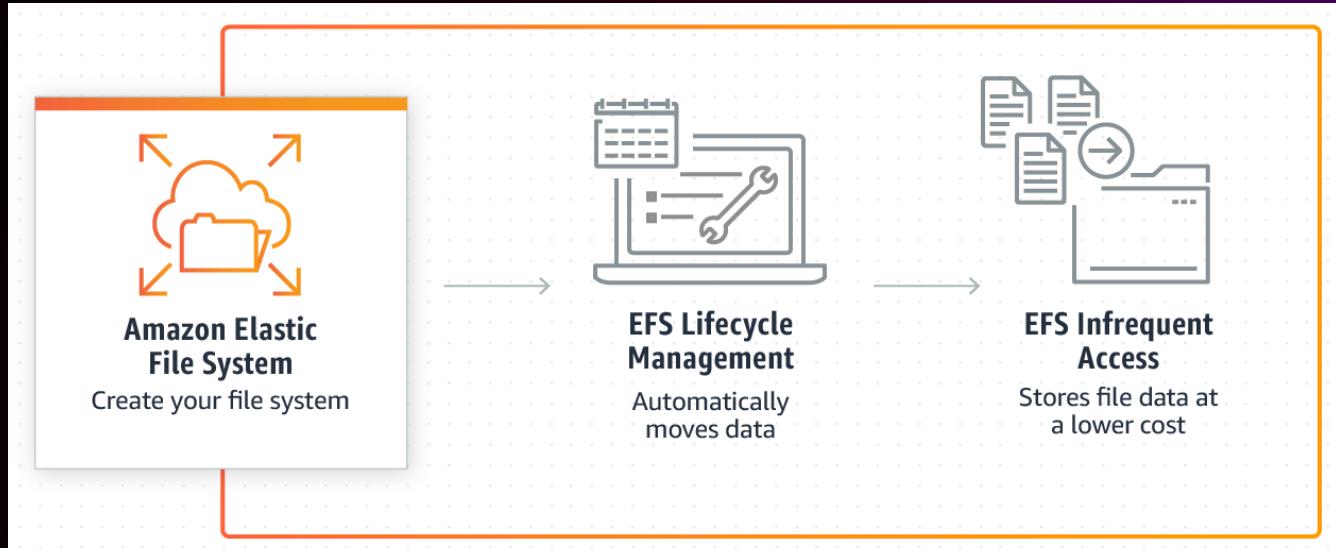
60%

Lower
read latency

40%

Lower
write latency

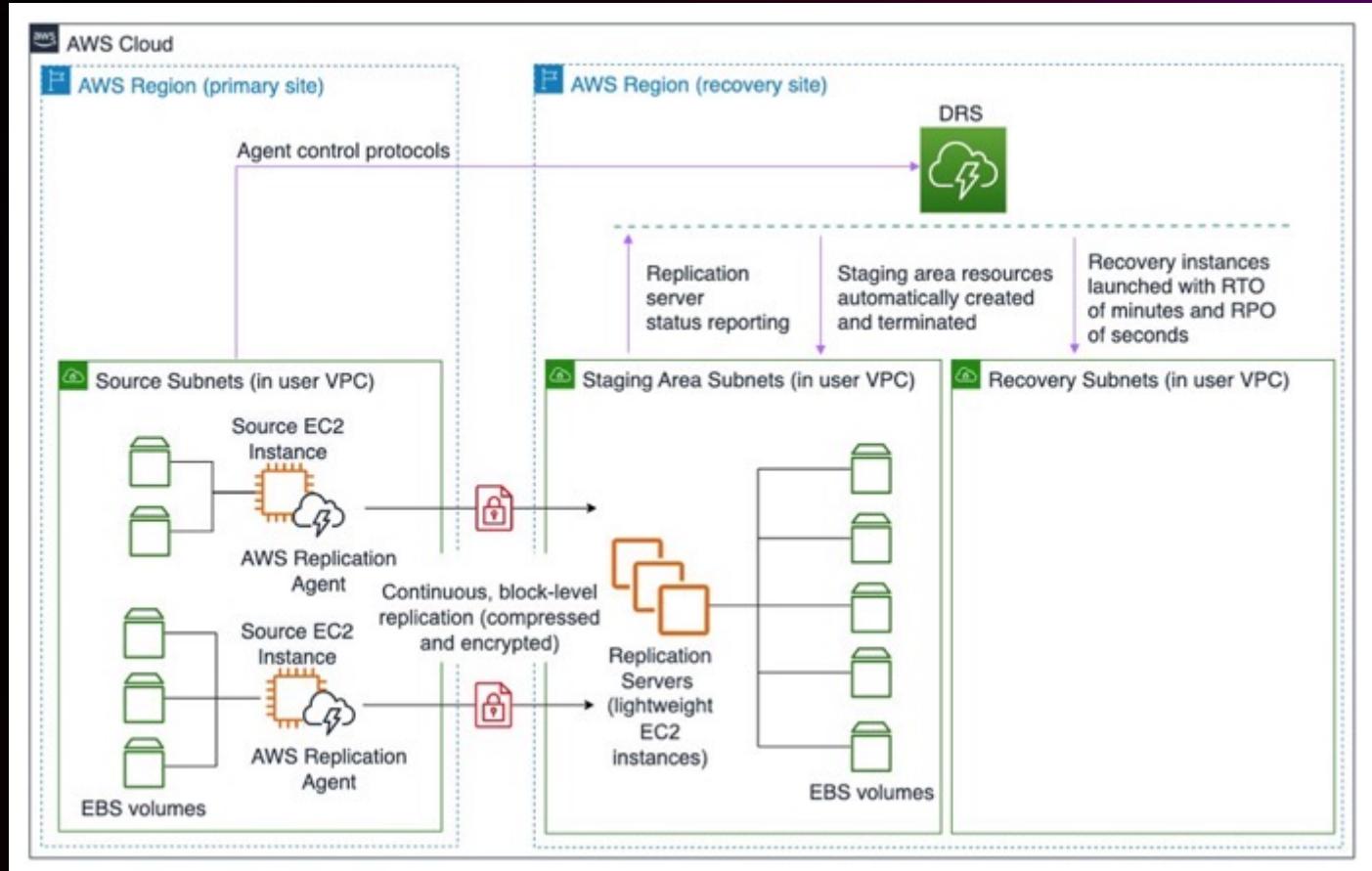
1-Day Lifecycle Management Policy



Elastic Disaster Recovery Automated Failback

AUTOMATED FAILBACK FOR EC2 WORKLOADS USING ELASTIC DISASTER RECOVERY

- Built into the AWS Elastic Disaster Recovery Service for EC2
- Simplify and streamline failback processes
- Execute recovery drills with confidence
- Can run across an AZ, another region, or even to on premises with a fallback client
- Simplified and expedited experience to failback to original regions



Cross Region Scenario

Torn Write Prevention

STORAGE RELIABILITY ENABLES ENHANCED DATABASE PERFORMANCE

Enabled on AWS
Nitro SSDs

Available on Ec2 I4i
instances and EBS volumes
for all Nitro based instances

Database
Performance

Up to 30% higher database
Transactions per Second
(TPS)

Reduce Cost

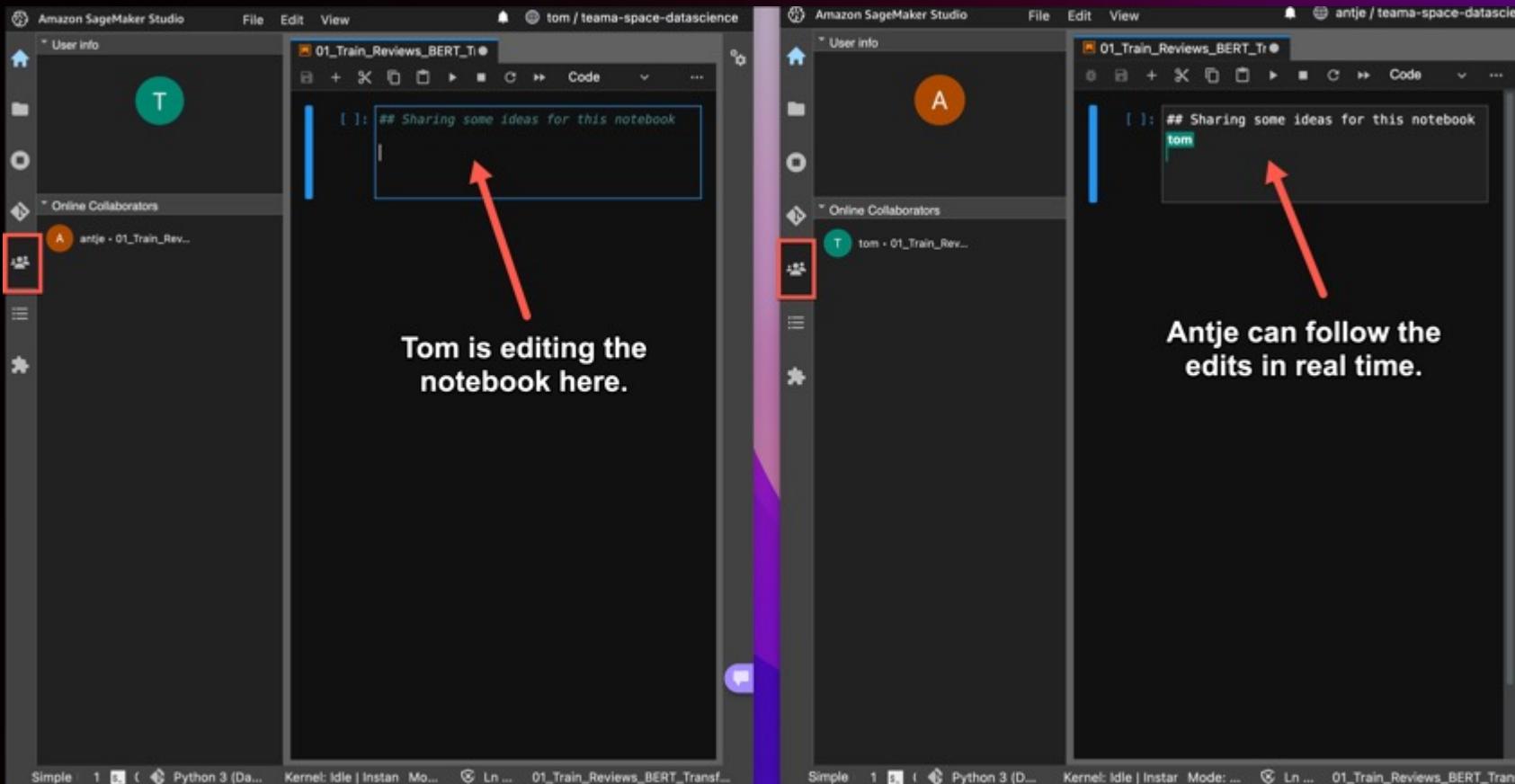
Improved database
performance eliminates the
need to overprovision or scale
up the cluster to meet
business growth, reducing TCO



Amazon SageMaker Studio Real-Time Collab

SHARED SPACES IN SAGEMAKER STUDIO WITH REAL-TIME MULTI-USER INTERACTION

- Share data, notebooks, and other ML resources easily
- Automatic tagging for organization, filtered views, and cots management
- Multiple SageMaker Studio Domains for multiple teams



Amazon SageMaker JumpStart

SHARE MODELS AND NOTEBOOKS WITHIN AND ACROSS TEAMS

The screenshot shows the Amazon SageMaker Studio interface. On the left, a sidebar menu is open with several options: Home, Data, AutoML, Experiments, Pipelines, Models (which is selected and highlighted with a red box), Shared models (also highlighted with a red box), Inference compiler, Edge packager, Deployments, Quick start solutions, and Learning resources. The main content area displays a list of shared models and notebooks. Three items are visible: 'Oil drilling prediction' (Prediction, Last updated: 3 hours ago), 'Healthcare facility listing' (Regression, Last updated: 1 day ago), and 'Tomato growth rate...' (LinearPredictor, Last updated: 2 days ago). Each item has a 'View model' or 'View notebook' button. At the bottom of the sidebar, there are buttons for 'Simple' and 'Advanced' modes.

Share models and resources



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Access shared resources as well as quick start solutions from SageMaker JumpStart

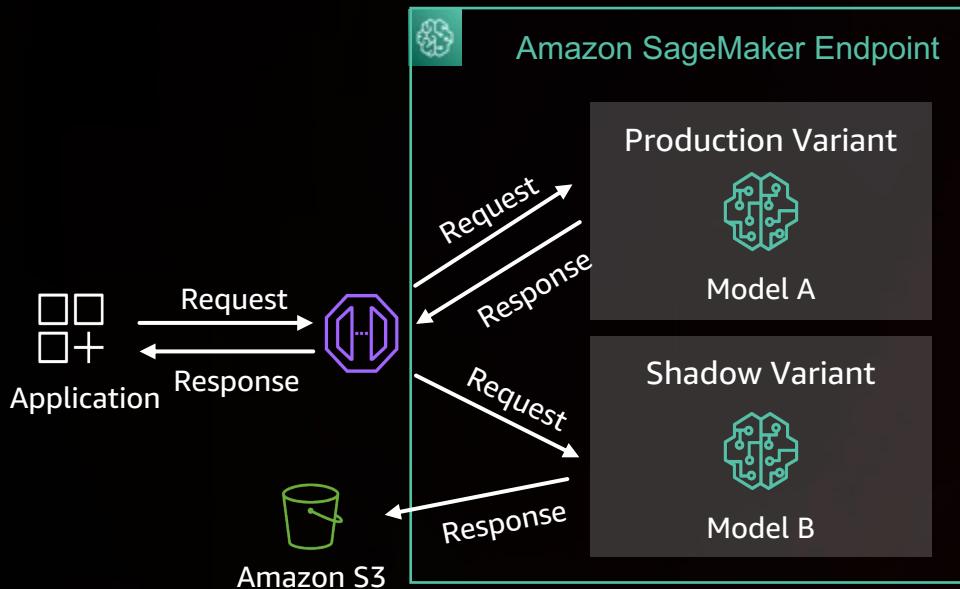
The screenshot shows the SageMaker JumpStart interface. The top navigation bar includes File, Edit, View, Run, Kernel, Git, Tabs, Settings, Help, and Report a bug. The main content area is titled 'SageMaker JumpStart - Quick Start Solutions'. It features two sections: 'Shared models and notebooks' and 'Solutions'. The 'Shared models and notebooks' section lists three items: 'Michigan population...' (Classification, Last updated: 3 days ago), 'Tomato growth rate...' (LinearPredictor, Last updated: 2 days ago), and 'Healthcare facility listing' (Regression, Last updated: 1 day ago). Each item has a 'View model' or 'View notebook' button. The 'Solutions' section lists four end-to-end machine learning solutions: 'Document Understanding' (Financial Services, Document summarization, entity and relationship extraction from text), 'Product Defect Detection' (Product Defect Detection, Identify defective regions in product images), 'Demand Forecasting' (Supply Decision Making, Demand forecasting for multi-variate time series data using deep learning models), and 'Language Model' (Non-Small model, Predictions for large language models). Each solution has a 'View solution' button.

SageMaker JumpStart

Amazon SageMaker Shadow Testing

EASILY COMPARE MODEL VARIANT PERFORMANCE IN PARALLEL ON LIVE DATA

Variant name	Sample count	Average (Microseconds)	Maximum (Microseconds)
P Production-01	28171	2142.90	11958.00
S Challenger-01	28171	2136.97 -0.28%	11771.00 +1.56%

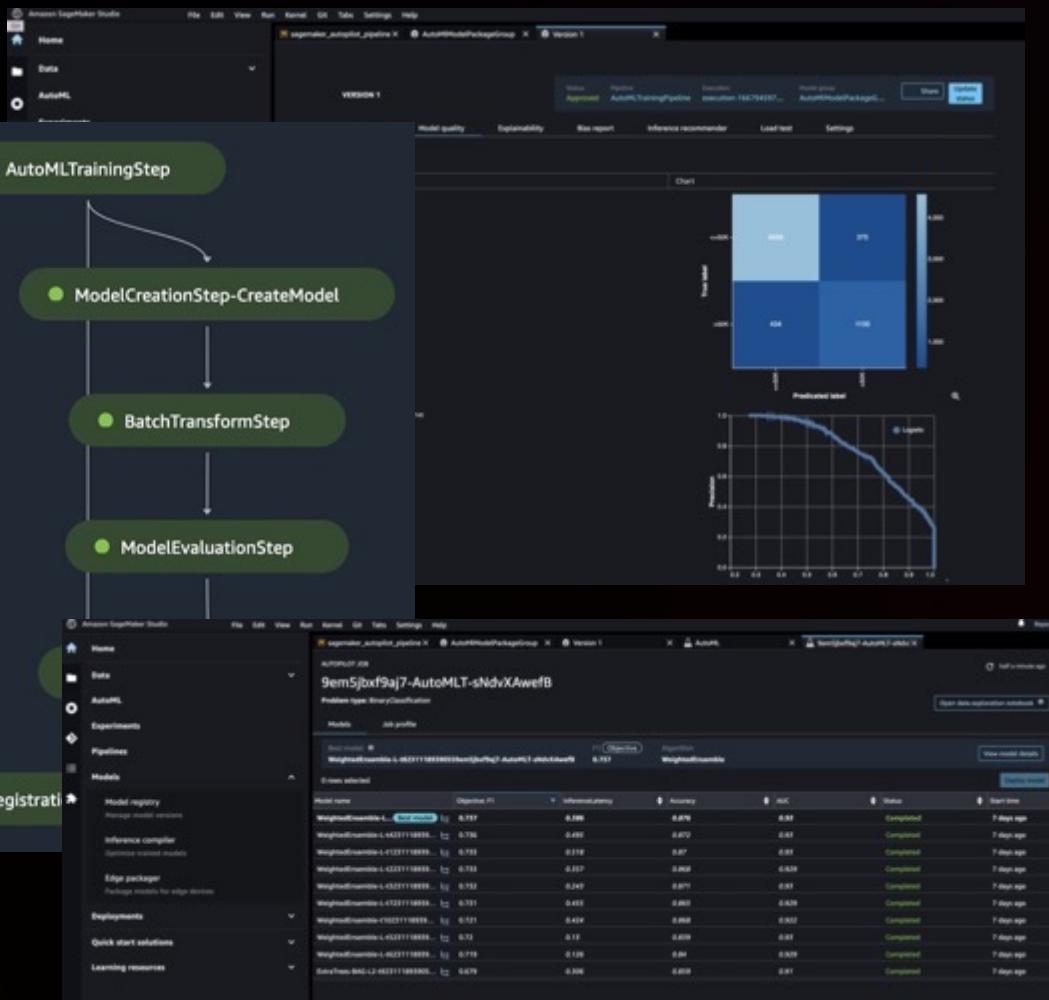


- Deploy new model variants in parallel to production
- Automatically route production requests to both models
- Capture Shadow responses to assess model output
- Validate Shadow resource utilization and performance
- Use SageMaker deployment guardrails for linear or canary promotion modes

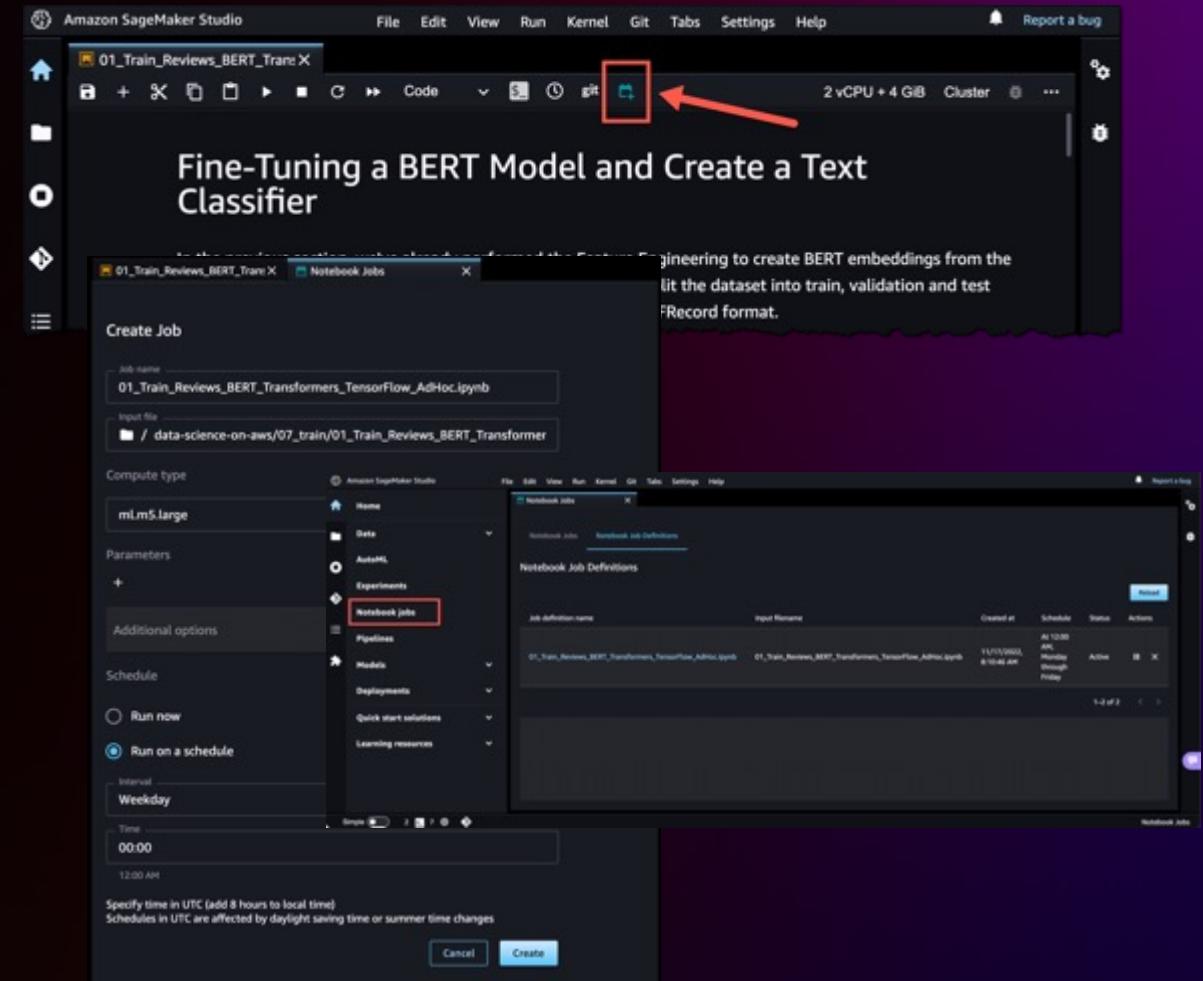
Amazon SageMaker – Simplified Production

USE AUTOML IN PIPELINES AND AUTOMATE NOTEBOOK EXECUTION

AutoML + Pipelines



SageMaker Notebook Jobs



Amazon SageMaker Studio Redesigned UI

STREAMLINED UI, MAPPED TO TYPICAL ML DEVELOPMENT WORKFLOW

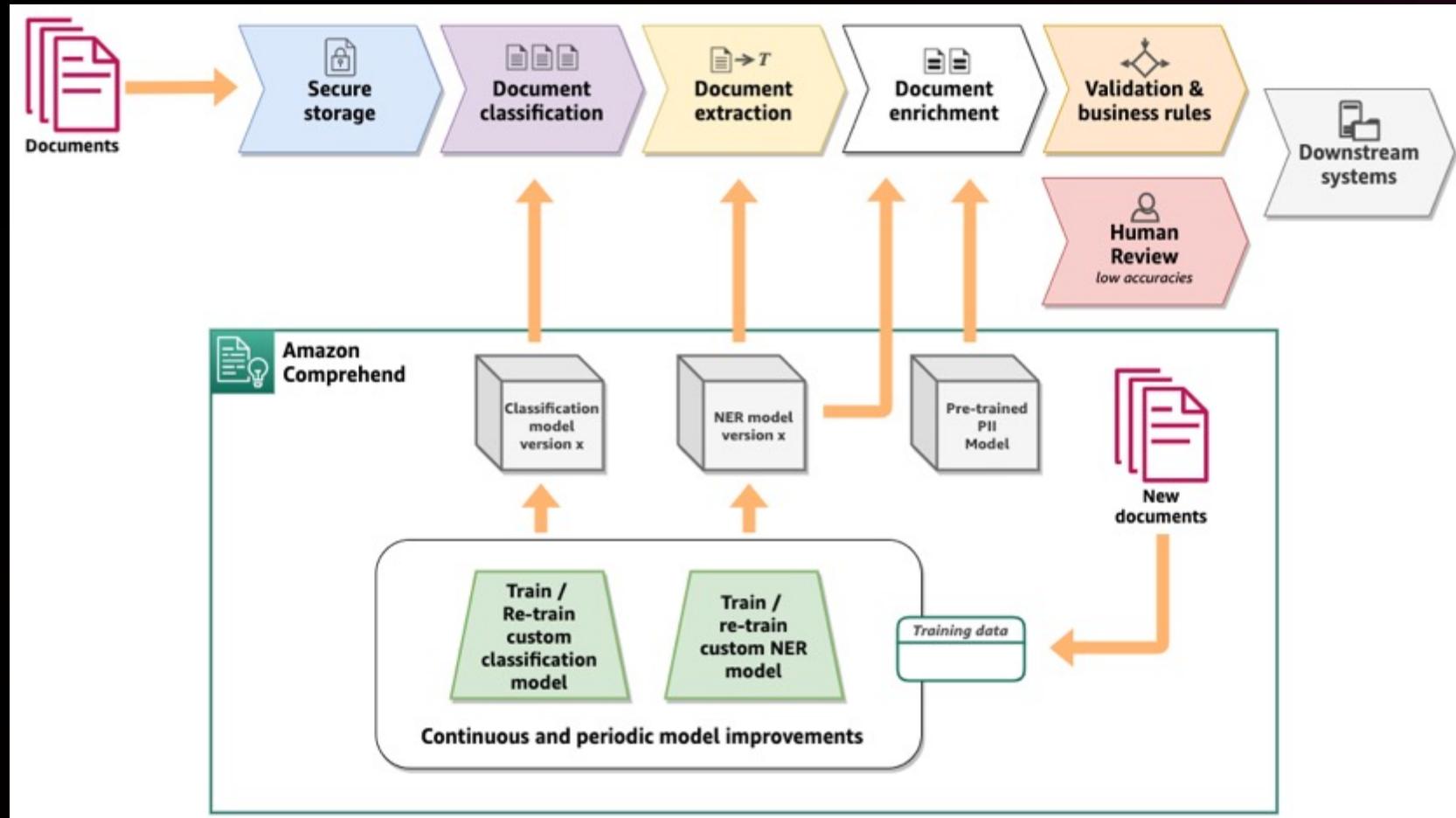
The image displays four screenshots of the Amazon SageMaker Studio interface, illustrating the redesigned workflow:

- Home:** The main dashboard featuring a sidebar with navigation links (Home, Data, AutoML, Experiments, Pipelines, Models, Deployments, Quick start solutions, Learning resources) and a central area with "Quick actions" (Open Launcher, Import & prepare data visually, Open the Getting Started notebook, Read documentation, View guided tutorials) and "Prebuilt and automated solutions" (Quick start solutions, AutoML).
- AutoML:** A detailed view of the AutoML section, which includes an "Introduction" to AutoML, a "Documentation" section, and a table listing existing AutoML experiments (e.g., delivery-tracking-project-01, Status: Completed, Modified on: 10/13/22 12:00 AM GMT-7, Created on: 10/13/22 12:00 AM GMT-7).
- Data Wrangler:** A visual data preparation tool. It shows an "Introduction" to Data Wrangler, a "Documentation" section, and a "Launcher" interface for creating notebooks, code consoles, and image terminals.
- Launcher:** A sub-interface of Data Wrangler. It allows users to select an "Image" (Data Science), "Kernel" (Python 3), "Instance" (ml.t3.medium), and "Start-up script" (No script). It also features buttons for "Create notebook", "Open code console", and "Open image terminal".



Amazon Comprehend Document Processing

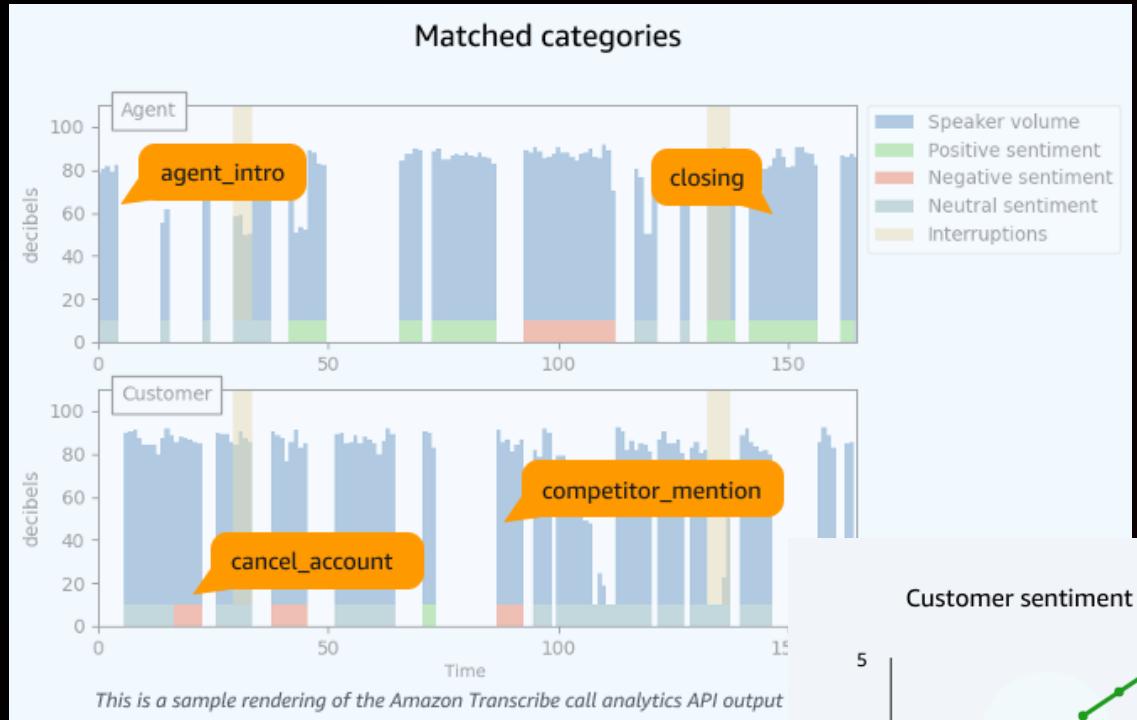
ONE-STEP CLASSIFICATION AND ENTITY RECOGNITION FOR INTELLIGENT DOCUMENT PROCESSING



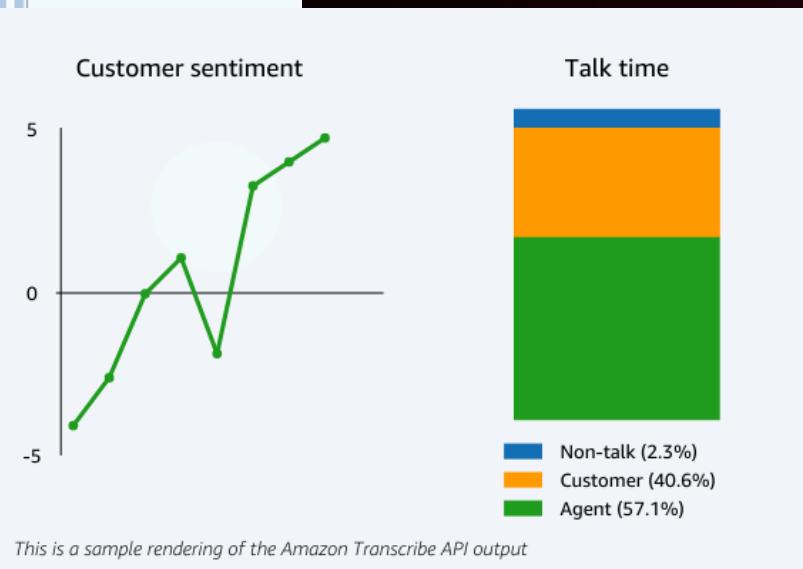
- Classify and extract entities from files, without extracting the text first
- Real-time inferencing of files as well as asynchronous batch processing on large document sets
- Combines OCR and Comprehend NLP capabilities to classify and extract entities

Amazon Transcribe Call Analytics API

ENABLING REAL-TIME CONVERSATION INSIGHTS ON LIVE CALL AUDIO STREAMS



- Call summarization
- Detailed call analytics and conversation insights
- Automated call categorization
- Protect sensitive customer data



Amazon Textract Analyze Lending API

NEW DOCUMENT EXTRACTION API FOR FINANCIAL DOCUMENT USE CASES

The screenshot shows the Amazon Textract interface with the 'Analyze Lending' demo selected. At the top, there are thumbnails of several document types: Payslip (Page 1), Check (Page 2), Identity document (Page 3), 1099 DIV (Page 4), and Bank statement (Page 5). Below this, a detailed view of a 'Check' document is shown, with its content and a signature field. To the right, the 'Document results' section displays extracted data fields:

Field	Value
BANK ROUTING NUMBER	122000496
ACCOUNT NUMBER	4040110157
CHECK NUMBER	0000000000
DATE	7/25/2008
ACCOUNT NAME	JOHN STILES
BORROWER NAME	JOHN STILES
PAYEE NAME	JOHN STILES
CHECK AMOUNT IN WORDS	TWO HUNDRED NINETY ONE AND 90/100 DOLLARS
DOLLAR AMOUNT	\$291.90
Signature 1	Detected

- Analyze and classify documents contained in mortgage loan applications
- Optimized for US financial documents, including bank statements, 1099s, W-2s, and other financial forms
- Perform financial field detection for data such as payslip hours and signatures
- Bounding boxes for all found fields and data



Amazon Kendra Tabular Search for HTML

SEARCH DATA TABLES EMBEDDER IN HTML AND SEMANTIC SEARCH IN NEW LANGUAGES

A screenshot of the Amazon Kendra search interface. At the top, there is a search bar with the query "What was the annual change of inflation rate in 2017?". Below the search bar, a message says "Test query with user name or groups". It shows "1-4 of 4 results" and lists "Amazon Kendra suggested answers". Under the heading "Inflation Rate US", there is a table:

	Year	Inflation Rate	Annual Change
4	2018	2.44%	0.31%
5	2017	2.13%	0.87%
6	2016	1.26%	1.14%

The URL "https://s3.us-west-2.amazonaws.com/useractiv.../Inflation Rate US.html" is shown below the table, along with a "Document fields" link.

Search more intuitively and effectively through tables embedded in HTML pages

A screenshot of the Amazon Kendra search interface. At the top, there is a search bar with the query "Which year had top inflation rate?". Below the search bar, a message says "Test query with user name or groups". It shows "1-4 of 4 results" and lists "Amazon Kendra suggested answers". Under the heading "Inflation Rate US", there is a table:

	Year	Inflation Rate	Annual Change
1	2021	4.70%	3.46%
2	2020	1.23%	-0.58%
3	2019	1.81%	-0.63%

The URL "https://s3.us-west-2.amazonaws.com/useractiv.../Inflation Rate US.html" is shown below the table, along with a "Document fields" link.

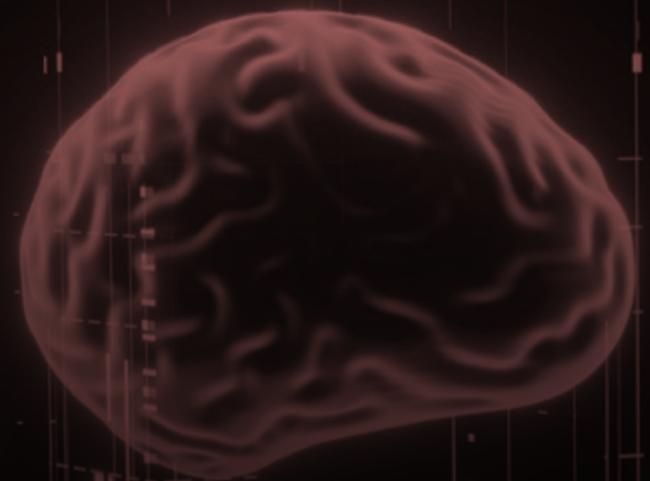
Semantic Search now available in:

- Spanish
- French
- German
- Portuguese
- Japanese
- Korean
- Chinese



AWS AI Service Cards

NEW RESOURCE TO SUPPORT AND ACCELERATE RESPONSIBLE AI DEVELOPMENT



Basic concepts of service and service features

Intended use cases and limitations

Responsible AI design considerations

- Fairness and bias
- Robustness
- Explainability
- Governance
- Transparency
- Privacy
- Security

Guidance on deployment and performance optimization

AWS ML University – Educator Enablement

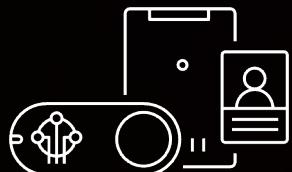
FREE ENABLEMENT FOR EDUCATORS TO DIVERSIFY DM/AI/ML GRADUATE PIPELINES



Ready-to-use tools



Ready-to-teach DM/AI/ML materials



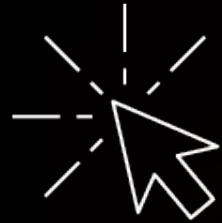
Free cloud computing capacity



Comprehensive faculty professional development

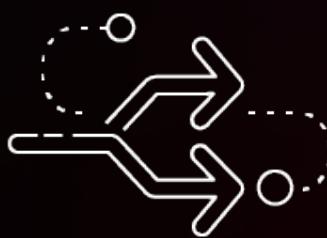
ENA Express

INCREASED THROUGHPUT WITH LOWER TAIL LATENCY FOR SOME INSTANCES IN SAME AZ



Simple

Enabled for network traffic between EC2 instances with a single API call



Transparent

Use TCP || UDP for your application and the SRD encapsulation will be done by the network



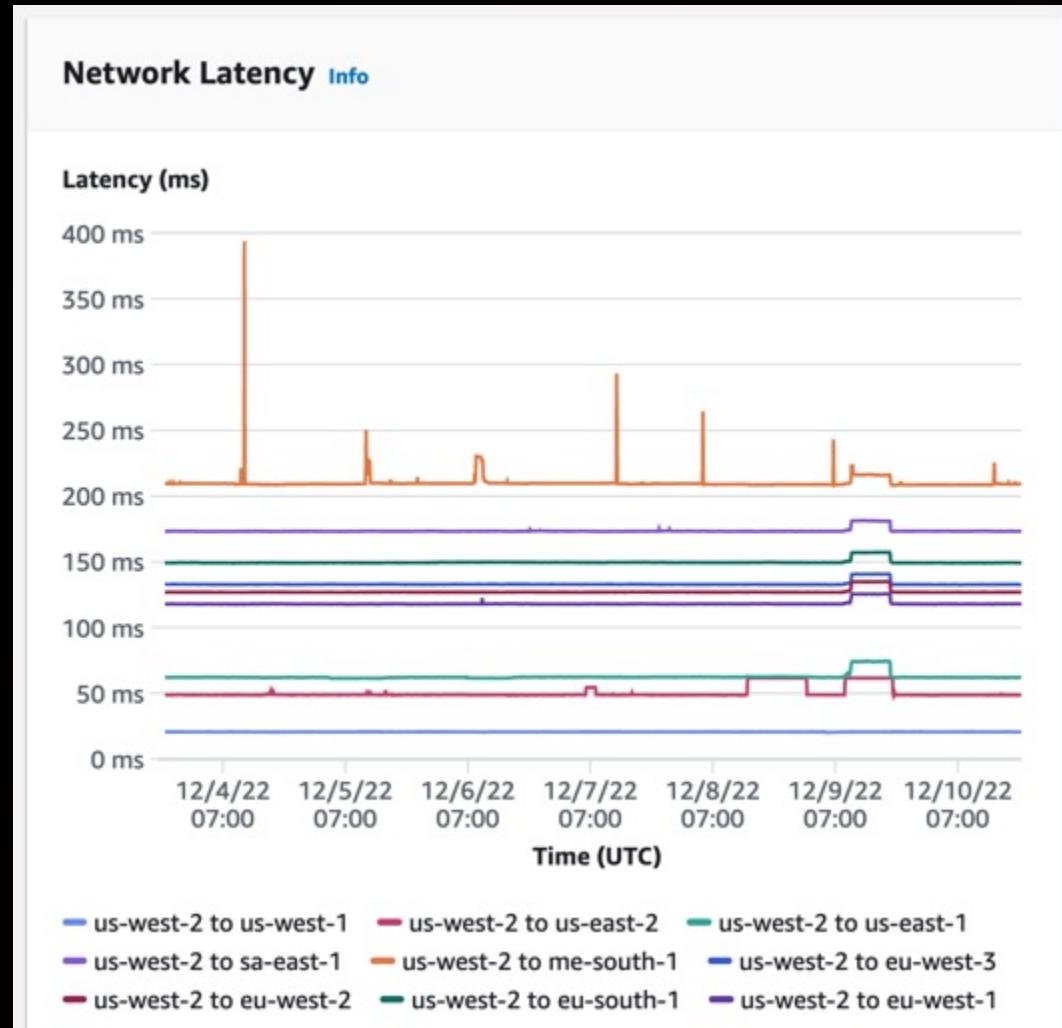
Performance

Reduces p99 network latency by up to 50%, and p99.9 latency up to 85%.

Single flow throughput up to 25 Gbps

AWS Network Manager Performance Monitoring

MONITOR THE REAL-TIME AND HISTORICAL PERFORMANCE OF THE AWS GLOBAL NETWORK

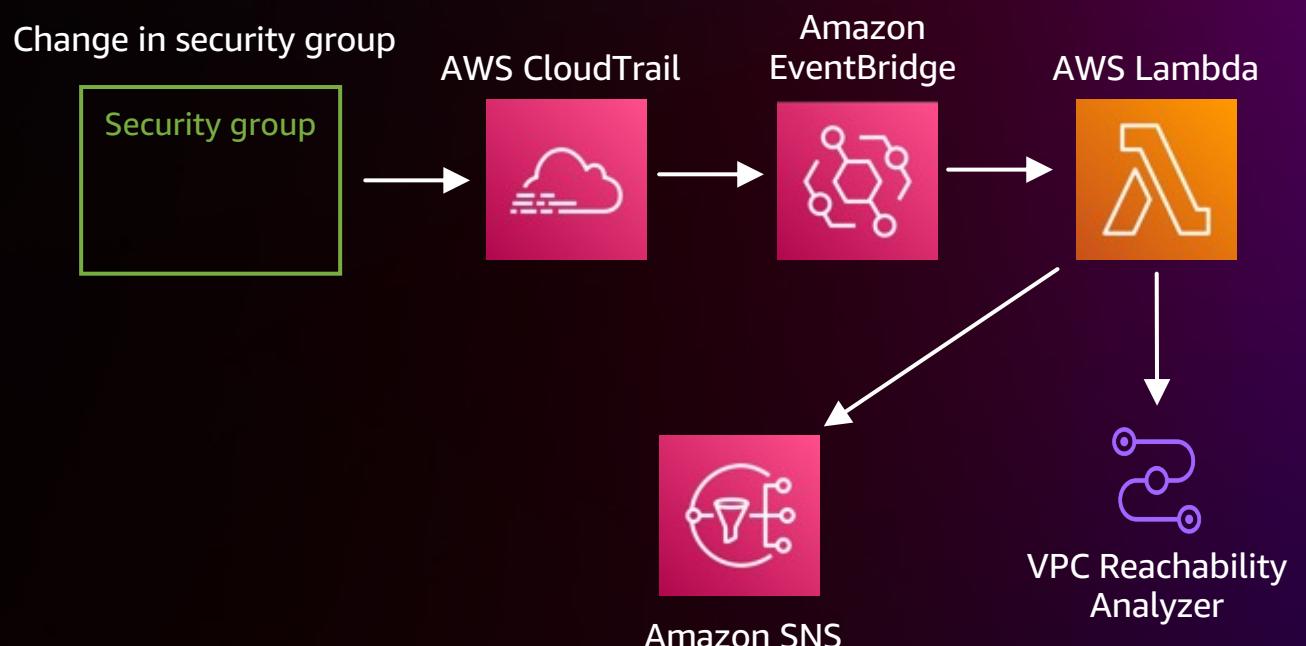
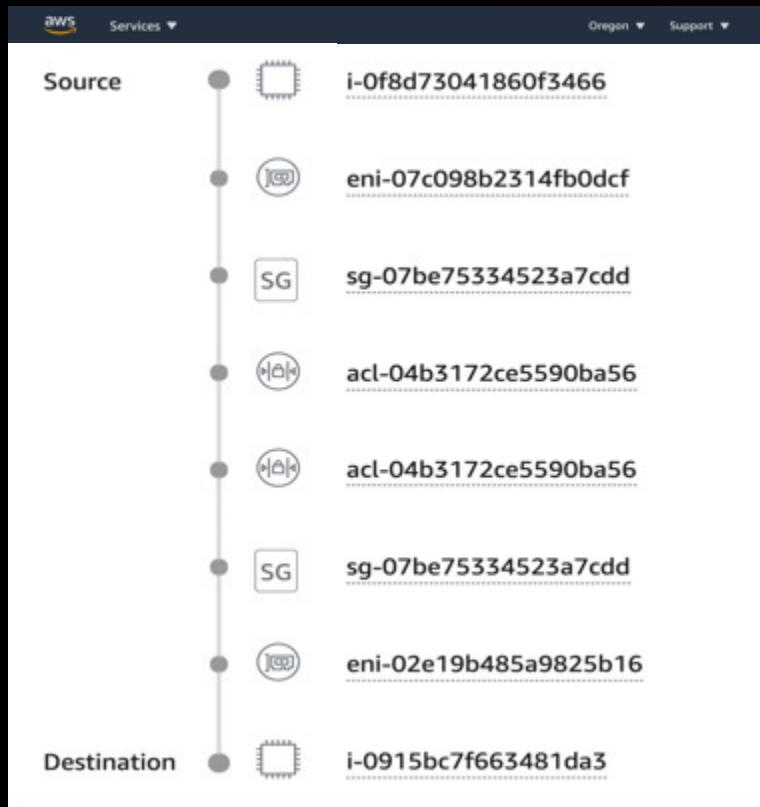


- Display average latency between AWS Regions, Availability Zones and within each Availability Zone
- Up to 5 minute Intervals
- View the 45 day historical trend
- Publish metrics to Amazon CloudWatch



VPC Reachability Analyzer Cross-account

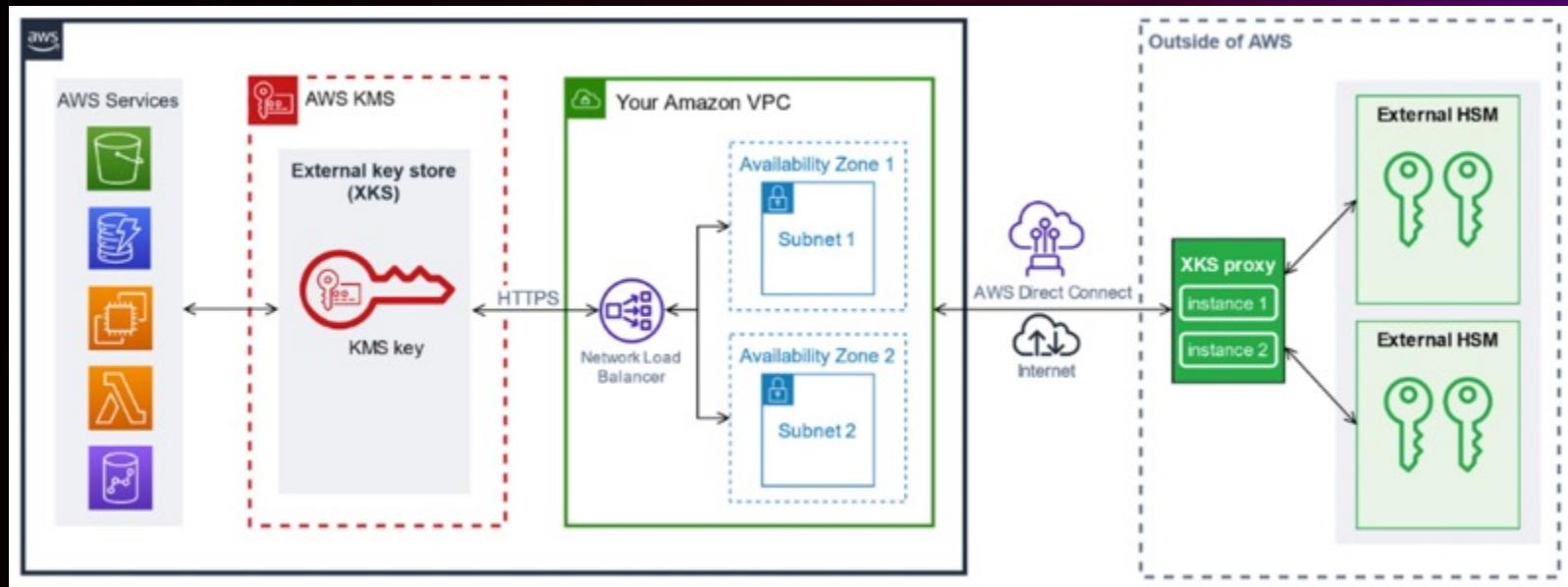
NETWORK REACHABILITY ANALYSIS BETWEEN AWS RESOURCES ACROSS DIFFERENT AWS ACCOUNTS



AWS KMS External Key Store (XKS)

CUSTOMER OPERATED EXTERNAL HSM SUPPORT FOR REGULATED WORKLOADS

- Replace KMS key hierarchy with customer managed root of trust
- Root keys generated and stored in external HSM
- KMS XKS proxy transforms KMS requests to native HSM format
- Allows an additional layer of authorization control



Unblock migrations for workloads that have regulatory requirements for external encryption keys

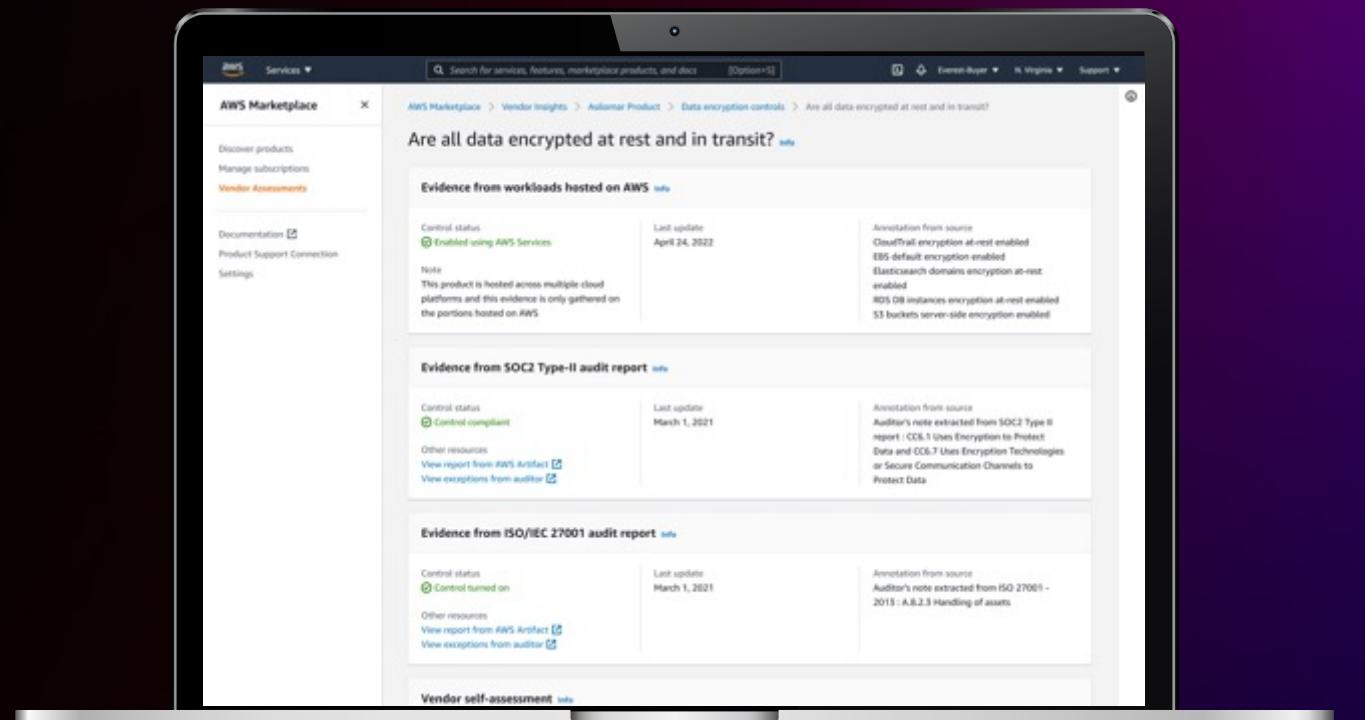
AWS Marketplace Vendor Insights

IMPROVE PROCUREMENT SPEED AND TRUST BY STREAMLINING VENDOR RISK ASSESSMENTS

Access security and compliance information with Vendor Insights

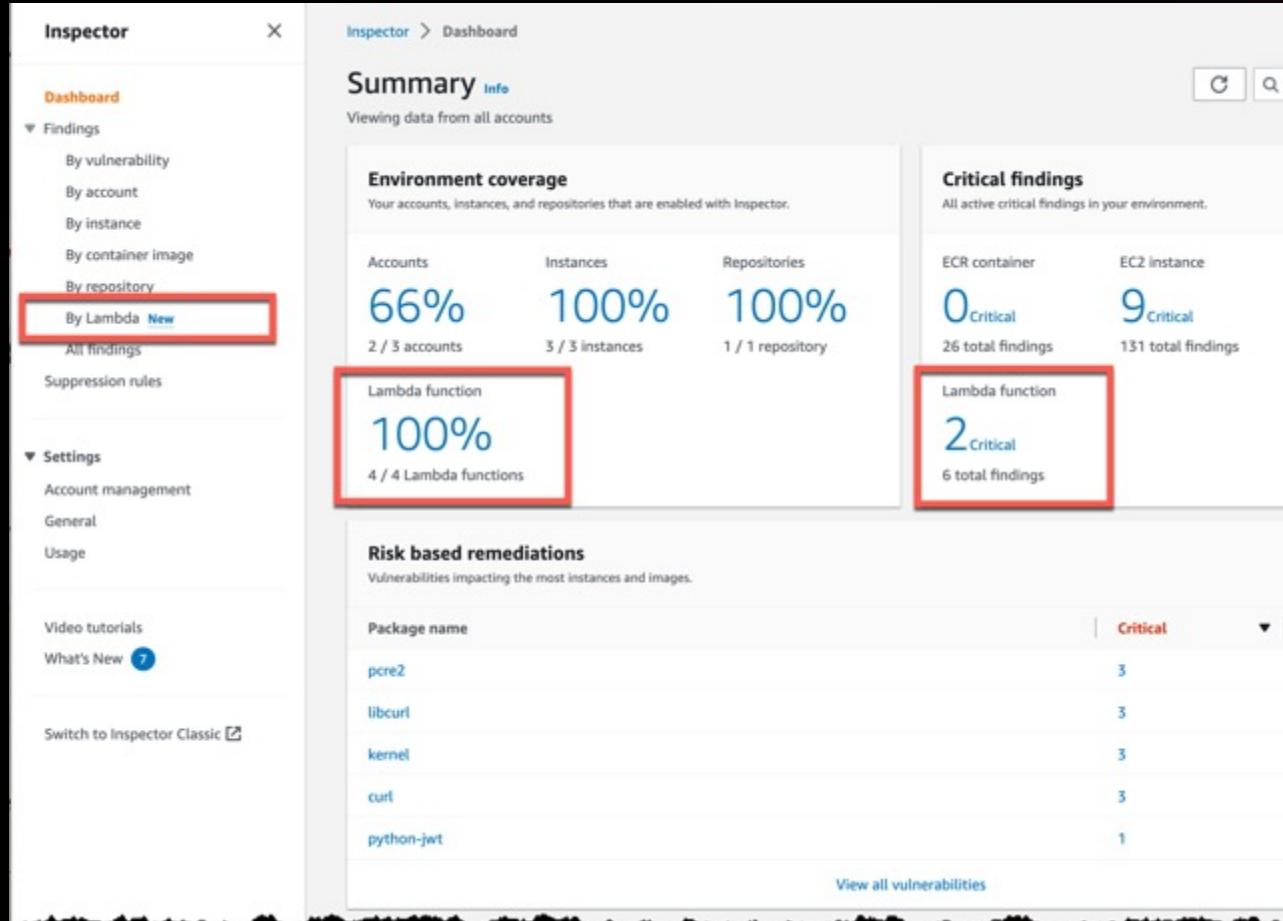
A single dashboard with summary of 125 key security and compliance controls, backed by evidence from up to three sources:

1. Automated evidence refreshed from AWS accounts using AWS Config and AWS Audit Manager
2. Audit reports, including: ISO 27001, SOC 2 Type II
3. Self-attested answers provided by vendors



Amazon Inspector Supports AWS Lambda

IDENTIFY VULNERABILITIES IN LAMBDA APPLICATION DEPENDENCIES



- Identify software vulnerabilities in application package dependencies used in Lambda function code
- Functions are continually monitored and reassessed, informed by updates to the function and newly published vulnerabilities
- Findings are aggregated in the Amazon Inspector Console, and pushed to AWS Security Hub and Amazon EventBridge

AWS Config Rules Proactive Compliance

EVALUATE CONFIG RULES BEFORE PROVISIONING

The screenshot shows the AWS Config Rules configuration interface. It includes sections for 'Evaluation mode' and 'Trigger type'. In 'Evaluation mode', two options are listed: 'Turn on proactive evaluation' (selected) and 'Turn on detective evaluation'. In 'Trigger type', the 'When configuration changes' option is selected.

Evaluation mode

Evaluation mode determines when resources will be evaluated; pre-provisioning or post-provisioning.

- Turn on proactive evaluation
Enable evaluation of resources prior to provisioning
- Turn on detective evaluation
Enable evaluation of resources which have been provisioned

Trigger type

AWS Config evaluates resources when the trigger occurs.

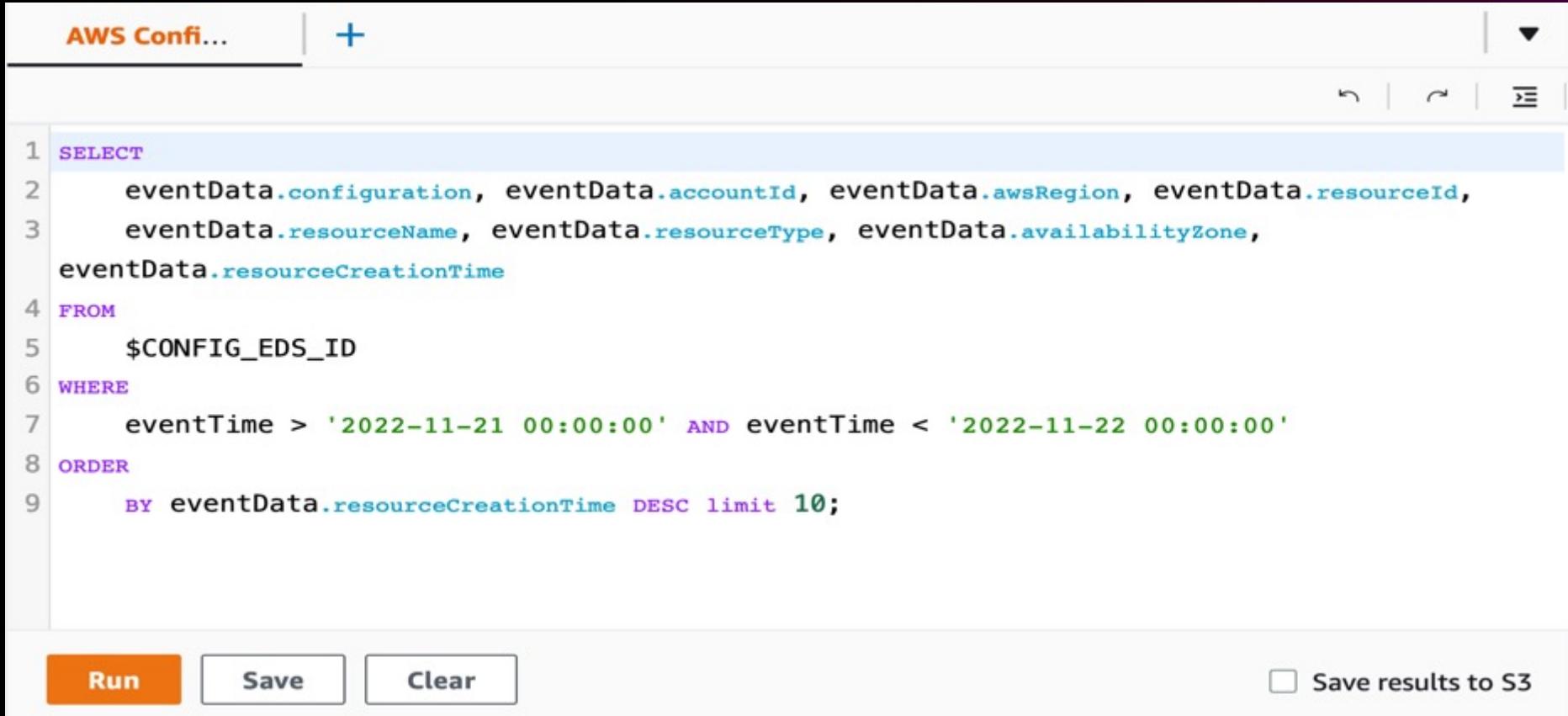
- When configuration changes
Runs when there are changes to your specified AWS resources
false

- Proactively check for compliance with AWS Config rules prior to resource provisioning
- Validate template compliance before sharing across the organization
- Integrate config validation as part of CI/CD process



AWS CloudTrail Lake supports AWS Config

ANALYZE AWS RESOURCE INFORMATION IN CENTRAL DATA LAKE



The screenshot shows a query editor window titled "AWS Config". The code area contains a SELECT statement:

```
1 SELECT
2     eventData.configuration, eventData.accountId, eventData.awsRegion, eventData.resourceId,
3     eventData.resourceName, eventData.resourceType, eventData.availabilityZone,
4     eventData.resourceCreationTime
5 FROM
6     $CONFIG_EDS_ID
7 WHERE
8     eventTime > '2022-11-21 00:00:00' AND eventTime < '2022-11-22 00:00:00'
9 ORDER
10    BY eventData.resourceCreationTime DESC limit 10;
```

Below the code are three buttons: "Run" (orange), "Save" (white), and "Clear" (white). To the right is a checkbox labeled "Save results to S3".



Amazon CloudWatch Cross-Account Observability

CENTRALIZE MONITORING AND DASHBOARDS ACROSS AN AWS ORGANIZATION

CloudWatch settings

Use a centralized monitoring account to monitor and troubleshoot applications seamlessly across multiple accounts - [new](#) [Info](#)

View metrics, logs, and traces with no account boundaries. [View quick guideline](#)

1. Configure monitoring account



2. Determine how to link source accounts



3. Link your source accounts via
CloudFormation or by the sharing URL



4. Browse cross-account data with the
monitoring account



Monitoring account configuration

Allow this account to view data from your source accounts.

To get started, sign in to the account that you want to use as a monitoring account.

Tip: We recommend that you create a new account in your organization to use as the monitoring account.

When you are signed in to the monitoring account, choose **Configure** to get started.

Not enabled

Configure

This can be done by the monitoring account only.

Source account configuration

To configure a source account, sign in to that account and use the CloudFormation template or the URL that you get from the monitoring account.

You can also choose which of metrics, logs, and traces to share with the monitoring account.

Not linked

Configure

This can be done by the source account only.



Amazon CloudWatch Data Protection

PROTECT SENSITIVE DATA IN CLOUDWATCH LOGS

- Leverage pattern matching and machine learning (ML) to detect and protect sensitive log data in transit.
- Choose from over 100 managed data identifiers
- View unmasked data with elevated IAM privileges

The screenshot shows the AWS CloudWatch Log Events interface. The URL in the address bar is: CloudWatch > Log groups > /aws/lambda/sam-test-data-protection-MyFunction-Vgb6qBmKmRoH > 2022/11/08/[LATEST]a3c4ac76fd6742e091e024099e21248f. The page displays log events for a Lambda function. The log entries are as follows:

Timestamp	Message
2022-11-08T16:12:16.687+02:00	START RequestId: a68f40b6-d002-4e08-91e3-34c76fb62ba2 Version: \$LATEST
2022-11-08T16:12:16.687+02:00	2022-11-08T14:12:16.687Z a68f40b6-d002-4e08-91e3-34c76fb62ba2 INFO This is a log with an email address but I won't show it to you here it is *****
2022-11-08T16:12:16.688+02:00	END RequestId: a68f40b6-d002-4e08-91e3-34c76fb62ba2
2022-11-08T16:12:16.688+02:00	REPORT RequestId: a68f40b6-d002-4e08-91e3-34c76fb62ba2 Duration: 1.46 ms Billed Duration: 2 ms Memory Size: 128 MB

A red box highlights the middle log entry, specifically the email address portion "*****". A "Copy" button is visible on the far right of the highlighted row.

AWS Control Tower Account Customization

CUSTOMIZE AWS ACCOUNTS WHEN YOU PROVISION THEIR RESOURCES FROM AWS CONTROL TOWER



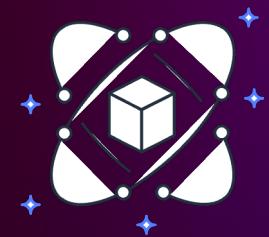
AWS Control Tower
Account Factory Customization



Accelerate development
of custom accounts
during account provisioning



Fully service-managed
solution



Supports existing
AWS Control Tower
and non-Control Tower
accounts

- Integrated into existing account workflow
- Build fully customized account blueprints
- Access 12 partner blueprints from partners like Splunk and Fortinet

AWS Control Tower Comprehensive Controls Management

PROGRAMMATICALLY IMPLEMENT CONTROLS AT SCALE ACROSS MULTI-ACCOUNT AWS ENVIRONMENTS

- More than 350 new controls for AWS services that are mapped to common control objectives and frameworks
- Integration with AWS Security Hub
- New proactive controls that block CloudFormation deployment of noncompliant resources

Controls (30) Info							Enable control
		<input type="text"/> Find controls		Clear filters			
Service	Name	Control objective	Implementation	Resource	Behavior	Release date	
Amazon RDS	[AWS-GR_RDS_STORAGE_ENCRYPTED] Detect whether storage encryption is enabled for Amazon RDS database instances	Encrypt data at rest	AWS Config rule	AWS::RDS::DBInstance	Detective	July 30, 2019	Edit
Amazon RDS	[CT.RDS.PR.16] Require an Amazon RDS database cluster to have encryption at rest configured	Encrypt data at rest	CloudFormation guard rule	AWS::RDS::DBCluster	Proactive	November 28, 2022	Edit



AWS IoT Core Device Location

TRACK AND MANAGE IOT DEVICES USING LOCATION DATA

The screenshot shows the AWS IoT Core Device Location interface. On the left, a sidebar lists various options like Monitor, Connect, Test, and Manage. Under Manage, the 'Devices' section is selected, showing a list of devices including 'LoRaWAN: Device f9889922-5137-4cbd-90d1-8bf08ecbef7'. The main panel displays the device's details: Device ID (f9889922-5137-4cbd-90d1-8bf08ecbef7), Name (tracker), Associated thing name (3273bb0e-41ce-4c22-b2b8-236a137d066f), Destination (packaged-lot313-lab-lorawan-us-east-1-DestinationForTracker), and Last uplink received at November 27, 2022, 21:52:49 (UTC-0800). Below this, there are tabs for Profiles, Device traffic, Position (which is selected), and Tags. A map of Seattle and surrounding areas shows the device's location marked with a blue dot inside a red box. To the right, a 'Position details' panel shows the timestamp (November 27, 2022, 22:01:13 (UTC-0800)), latitude (47.6), longitude (-122.3), altitude (0), and horizontal accuracy (0).

- Track IoT devices using location data, such as lat/lon
- Use IPS, GNSS, WiFi scan, cellular triangulation, and reserve IP lookup for location
- Public location to device shadow or IoT topic
- Perform actions based on location and integrate with Amazon Location Service
- AWS Partners include Semtech, HERE, and MaxMind



AWS IoT Device Management Scheduled Jobs

HIGH LEVEL SUMMARY DESCRIPTION

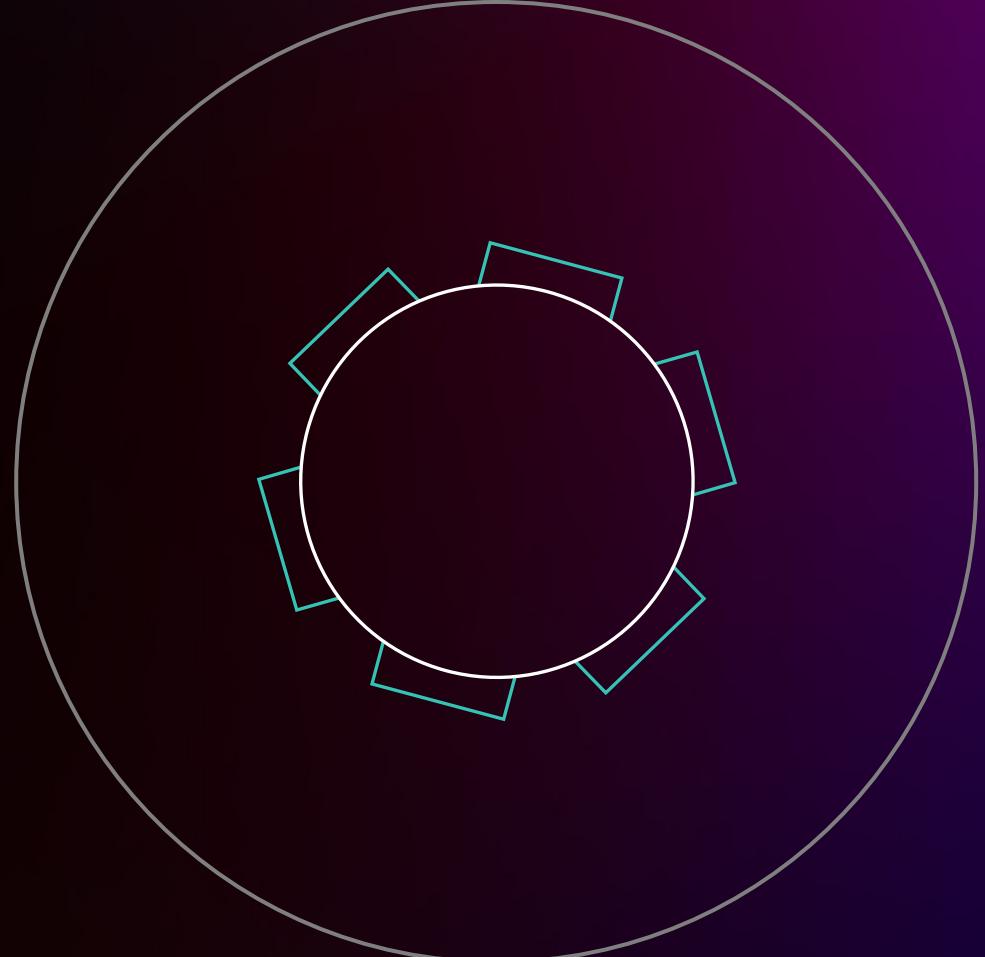


- Run remote operations during pre-defined time windows
- Avoid disruption of IoT device usage
- Schedule job rollout start/end times
- Support variety of rollout schedules and deployment cadences
- Does not require device side code

AWS IoT MQTTv5 Message Broker

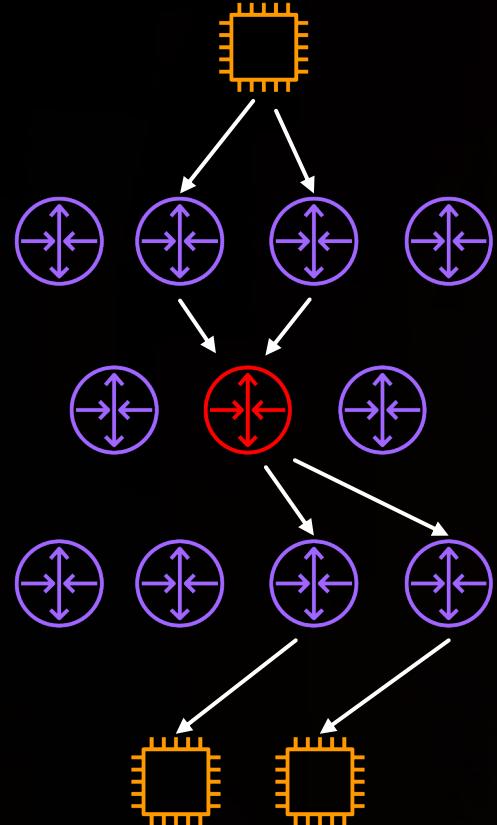
UPGRADED MESSAGE BROKER SUPPORTS MQTTv5 AND HETEROGENOUS DEPLOYMENTS

- Transparent messaging with Request/Response pattern
- Flexible messaging with user properties feature
- Efficient bandwidth usage with topic aliases
- Improved device control with message expiry, session expiry, and clean start capability
- Enhanced device connectivity flow using reason codes



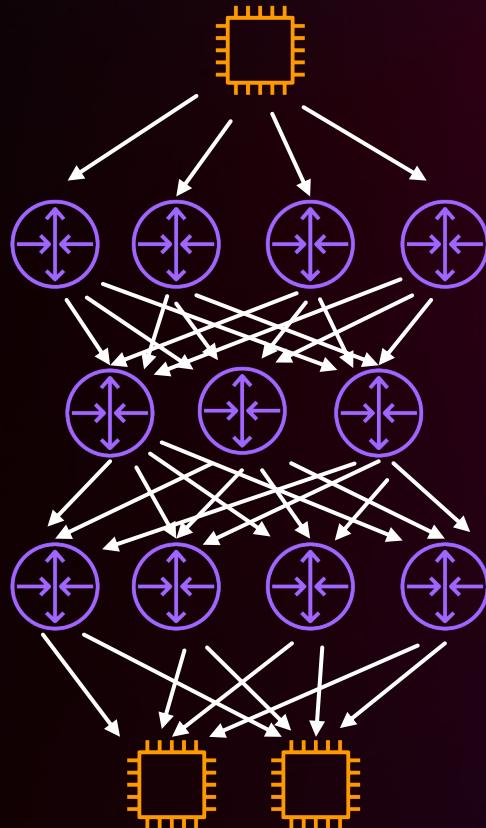
Traditional ECMP vs SRD

- Equal Cost Multipathing (ECMP)



- Based on 5-tuple hashing
- Limits single flow bandwidth to 5 Gbps
- Can introduce hot-spots that cause higher latency variation (Jitter)
- Makes sure packets always arrive in order for single flows

- Scalable Reliable Datagram (SRD)



- Nitro card “sprays” traffic over all paths
- Paths are monitored for latency and removed when necessary
- Introduces packet re-ordering that is corrected in the upper layers