INNOVATE

AI/ML EDITION

24 February 2022

rethinking machine learning for regulated industries

Natacha Fort
AI/ML Domain Solutions Architect, AWS

Agenda

It’s 2022 and ML impacts nearly every business process, decision and outcomes

It starts with data

Provision self-service ML environments with guardrails

Operate ML workloads with governance

Resources to get you started!

What is the ML ambition for an organization?

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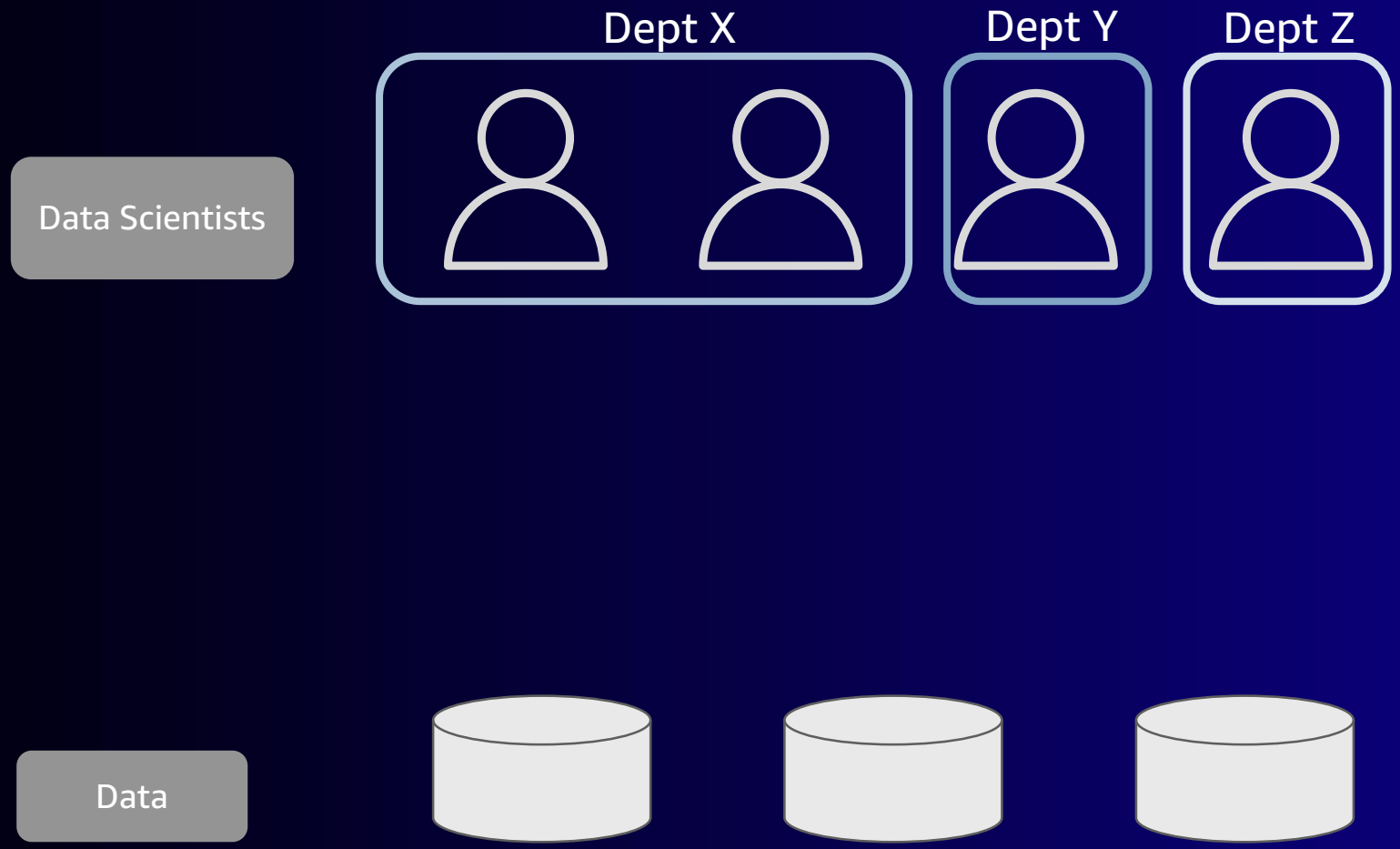

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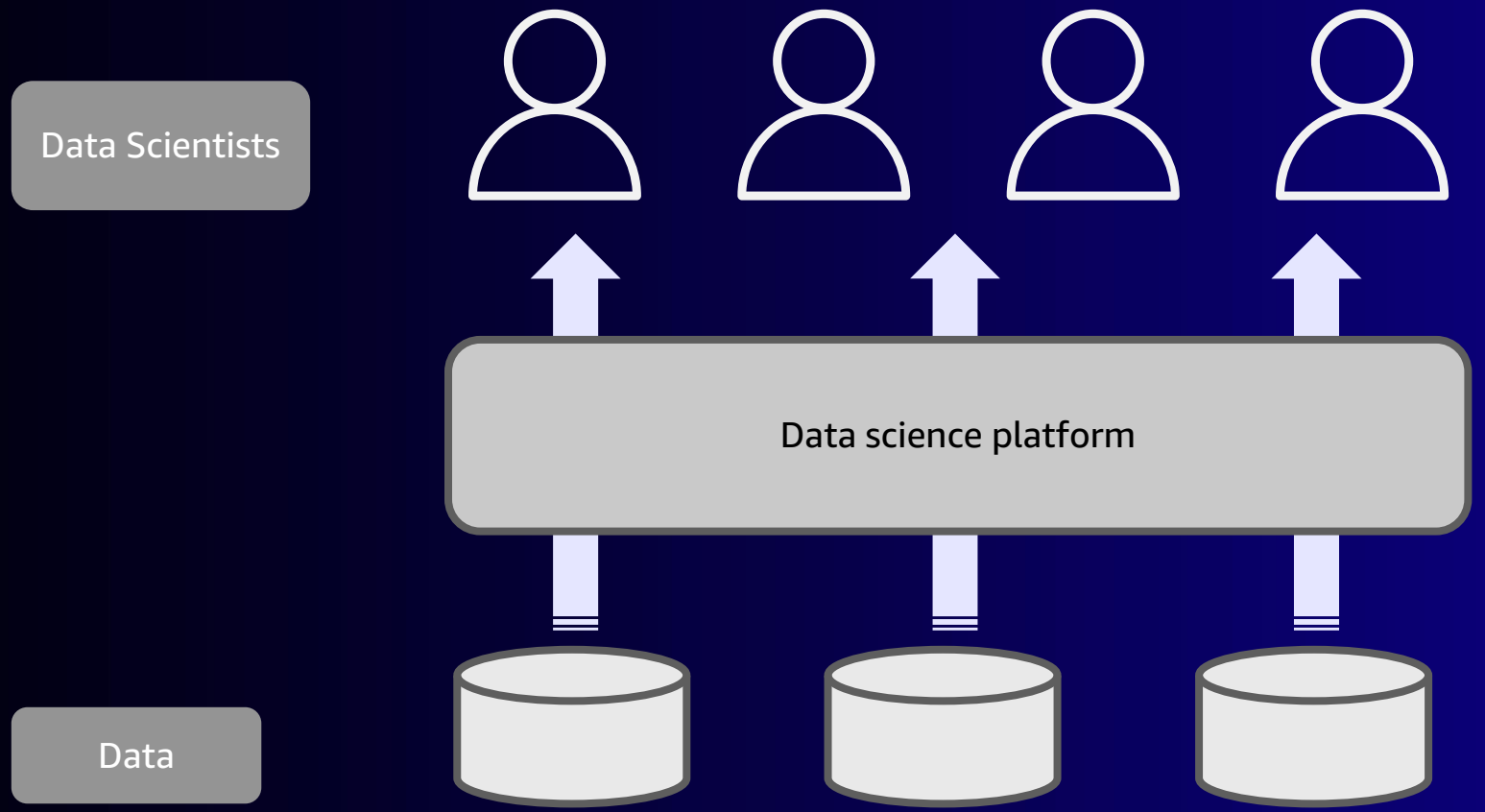

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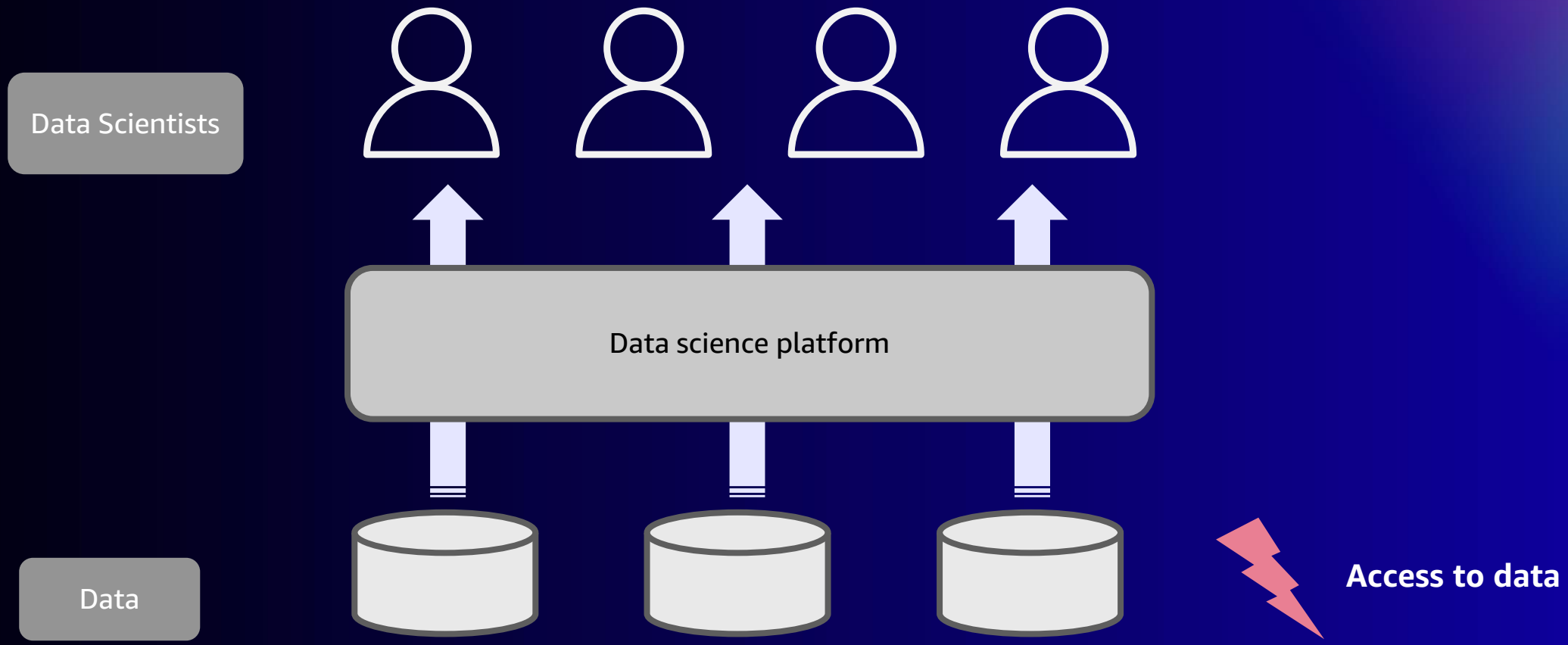

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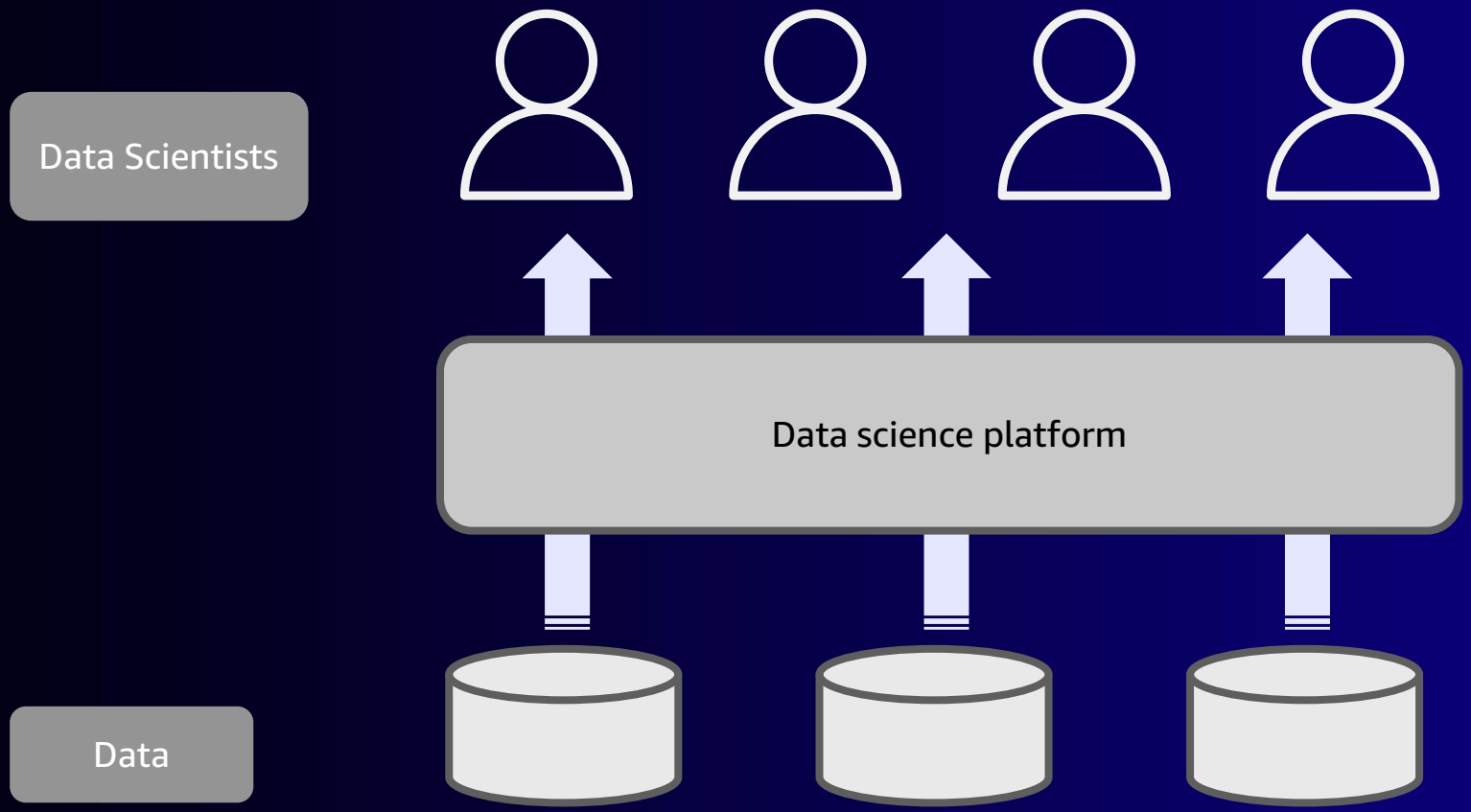
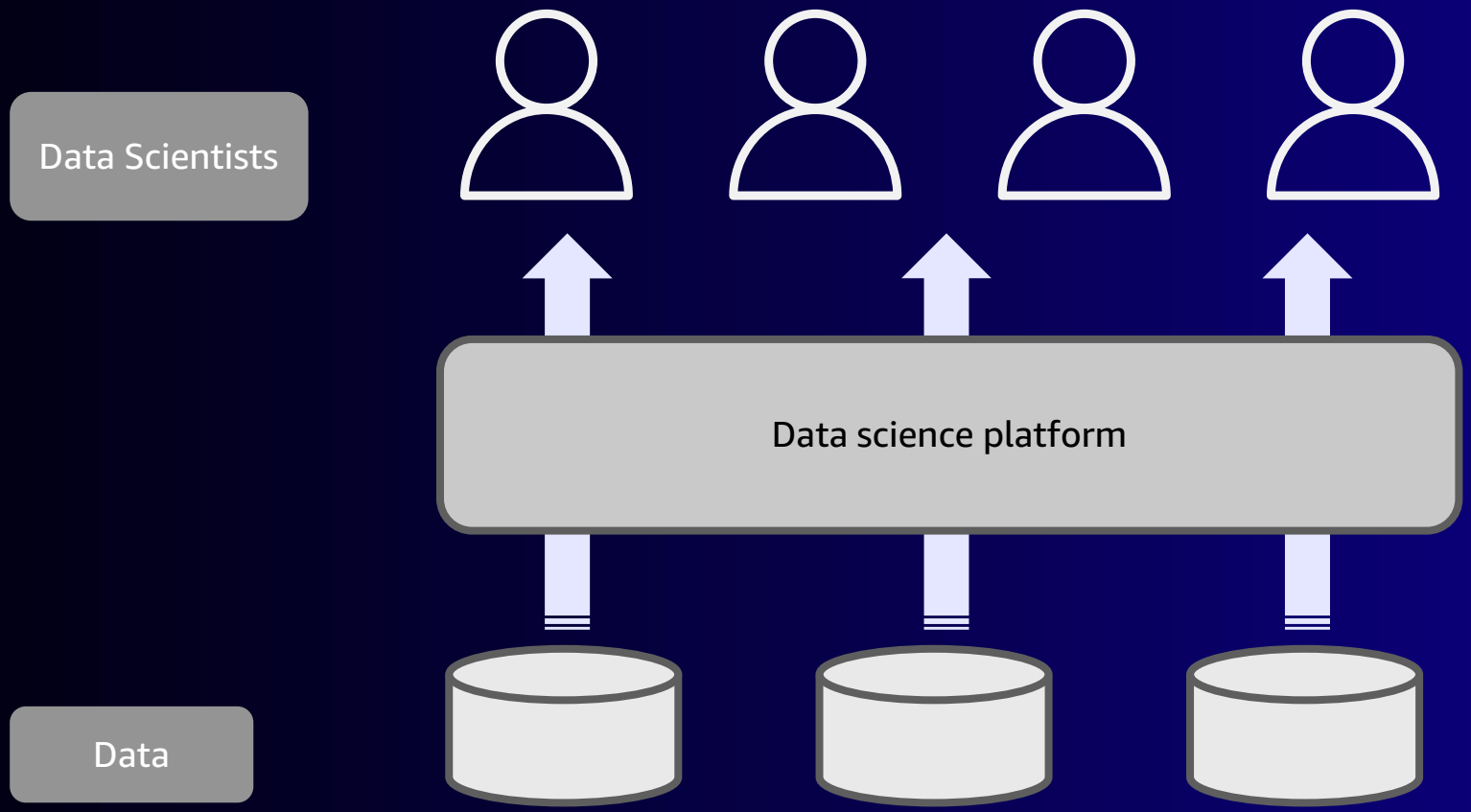


Access to flexible compute

Secure and governed environment

Access to data

What is the ML ambition for an organization?



Standardization

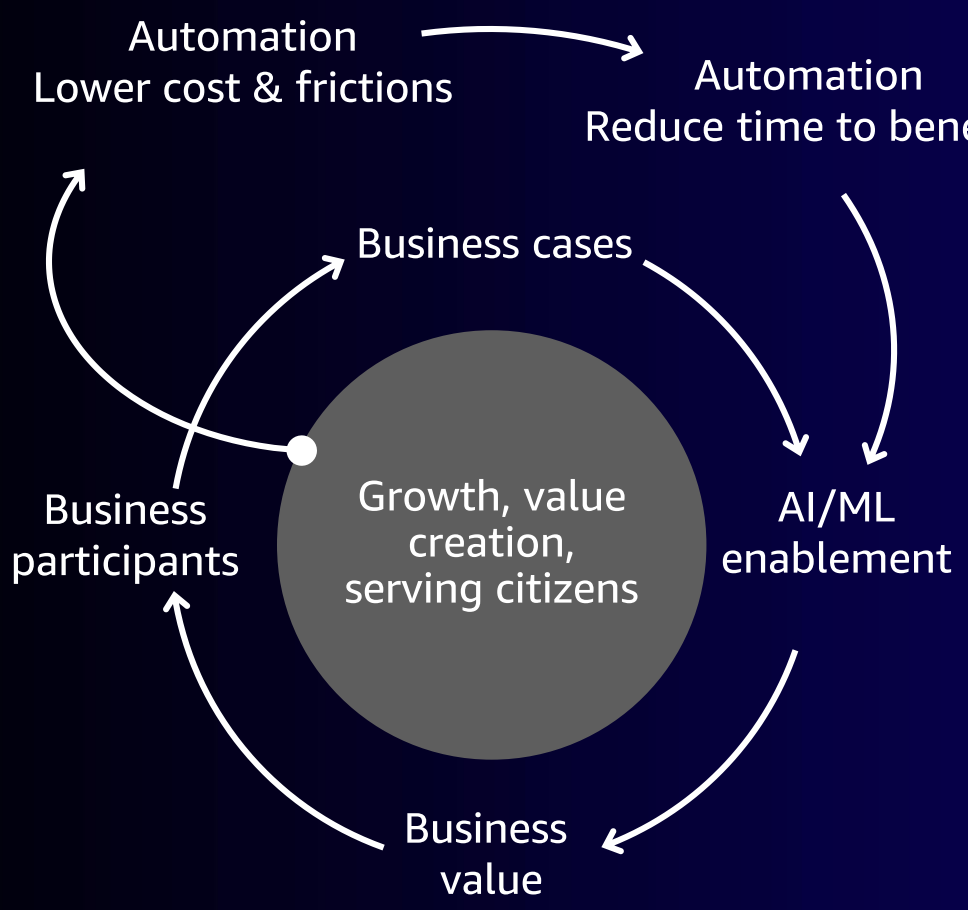
Pre-built patterns

Access to flexible compute

Secure and governed environment

Access to data

It is possible through automation

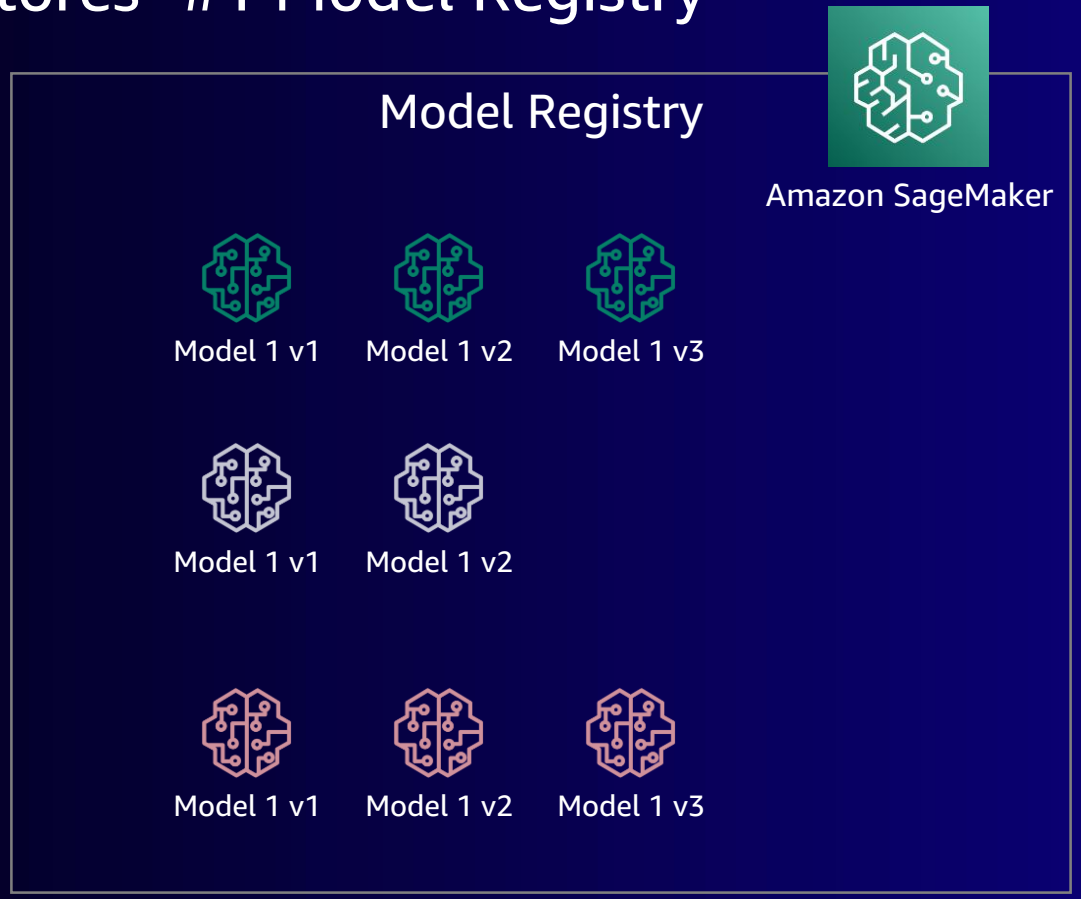


Centralized data strategy
+
Standardized and self service environments with guardrails
+
MLOps

Centralized data strategy: regulated ML capabilities

Capabilities for regulated machine learning

- Searchable artefact stores- #1 Model Registry



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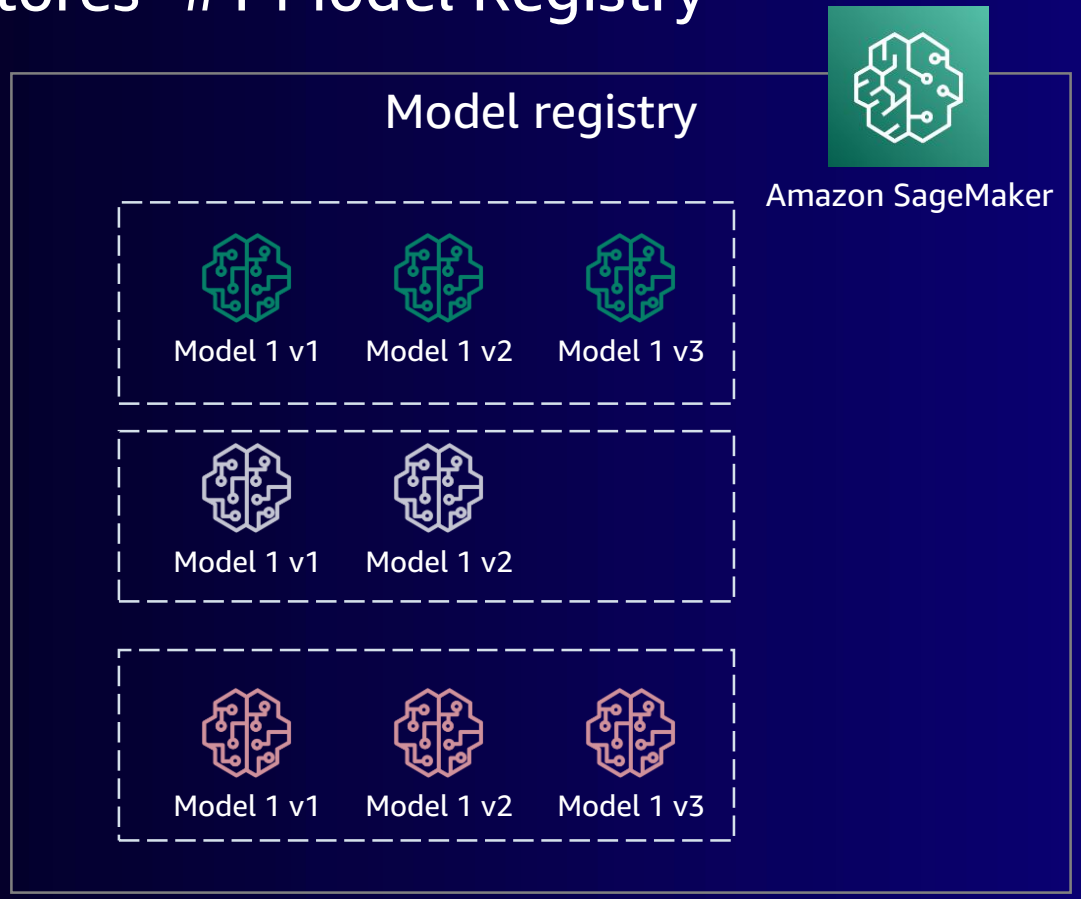

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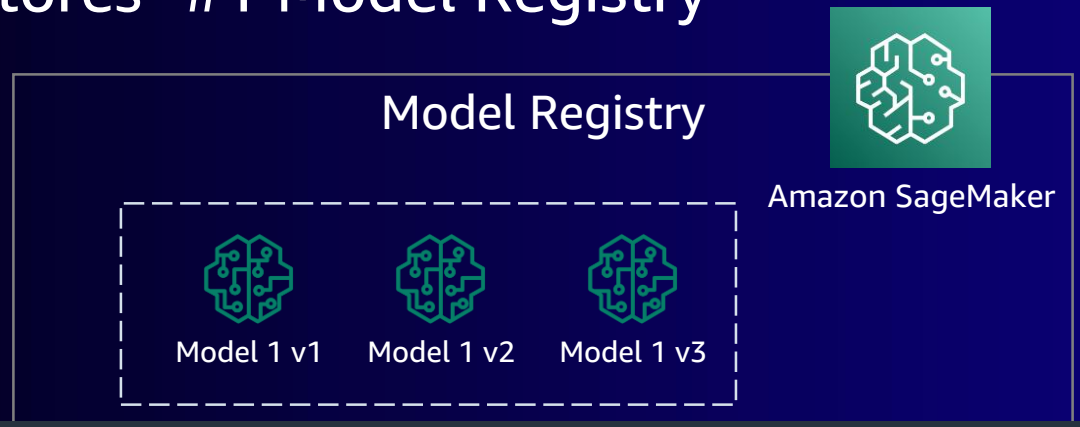


Helps with auditability and traceability requirements to manage risk and compliance

MNIST-classification-model-group

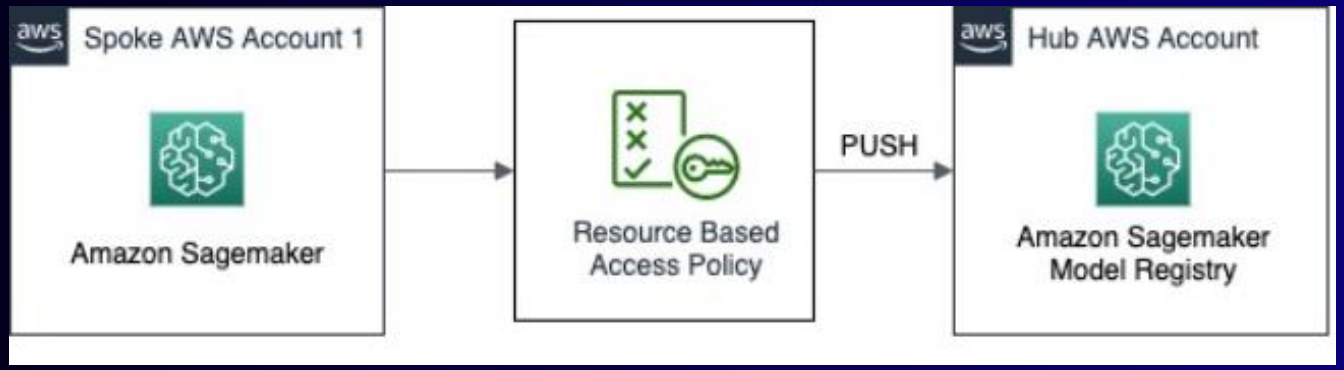
Experimentation models create for MNIST classification

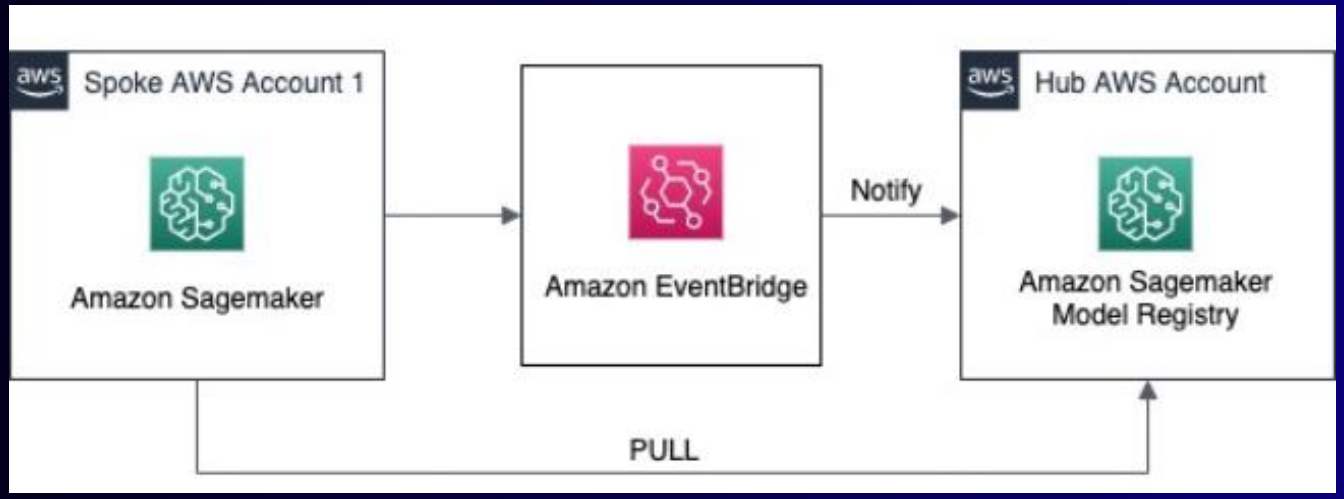
Versions | Settings

Search column name to start

Version	Stage	Status	Short description	Modified by	Last modified	Actions
3	None	Approved	Epoch 22, Learning rat...	gusn	12 minutes ago	...
2	None	Rejected	Epoch 22, Learning rat...	gusn	13 minutes ago	...
1	None	Rejected	Epoch 20, Learning rat...	gusn	12 minutes ago	...

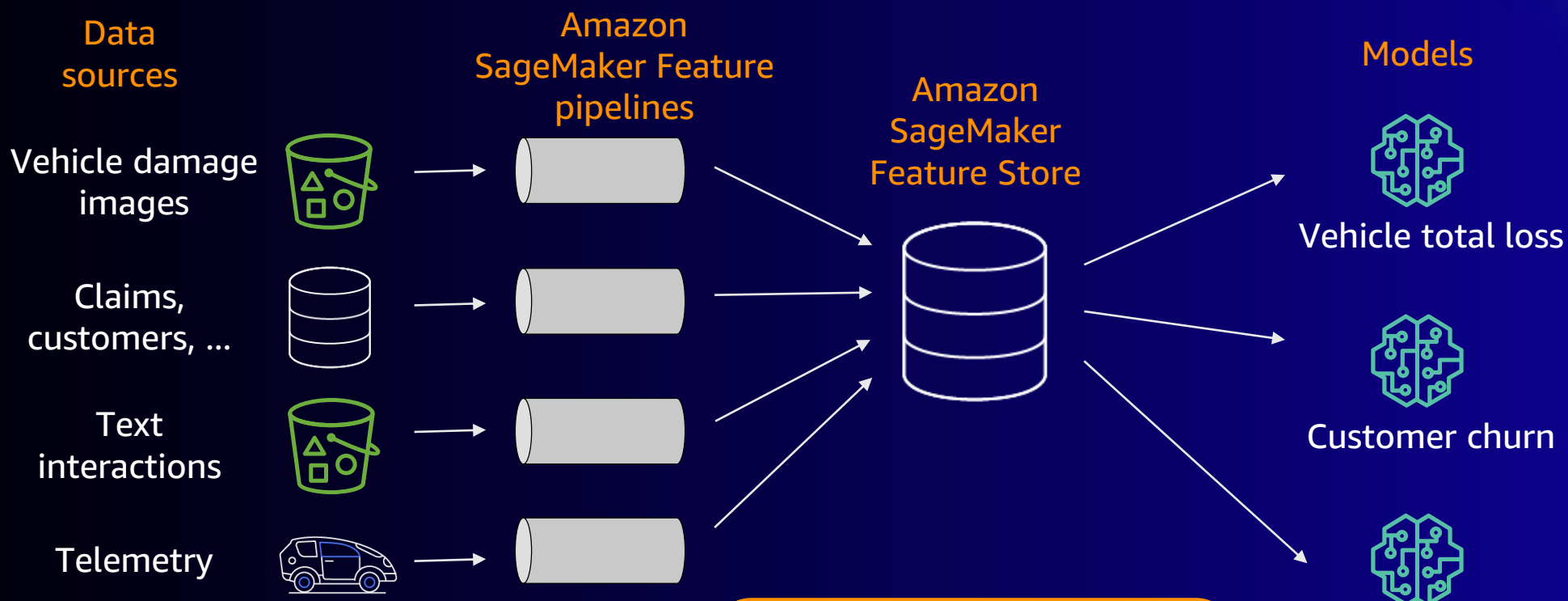
Patterns for multi-account, hub-and-spoke Amazon SageMaker model registry





Capabilities for regulated machine learning

- Searchable artefact stores- #2 Amazon SageMaker Feature Store



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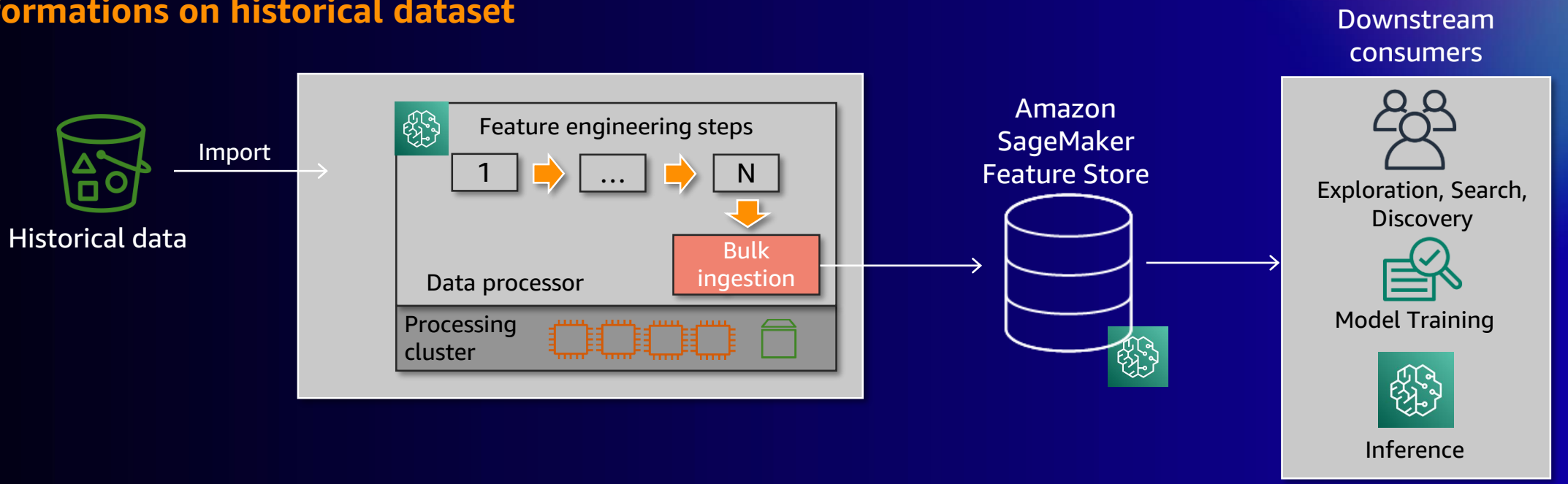
Capabilities for regulated Machine Learning

- Searchable artefact stores- #2 Amazon SageMaker Feature Store

1. Create transformations on historical dataset



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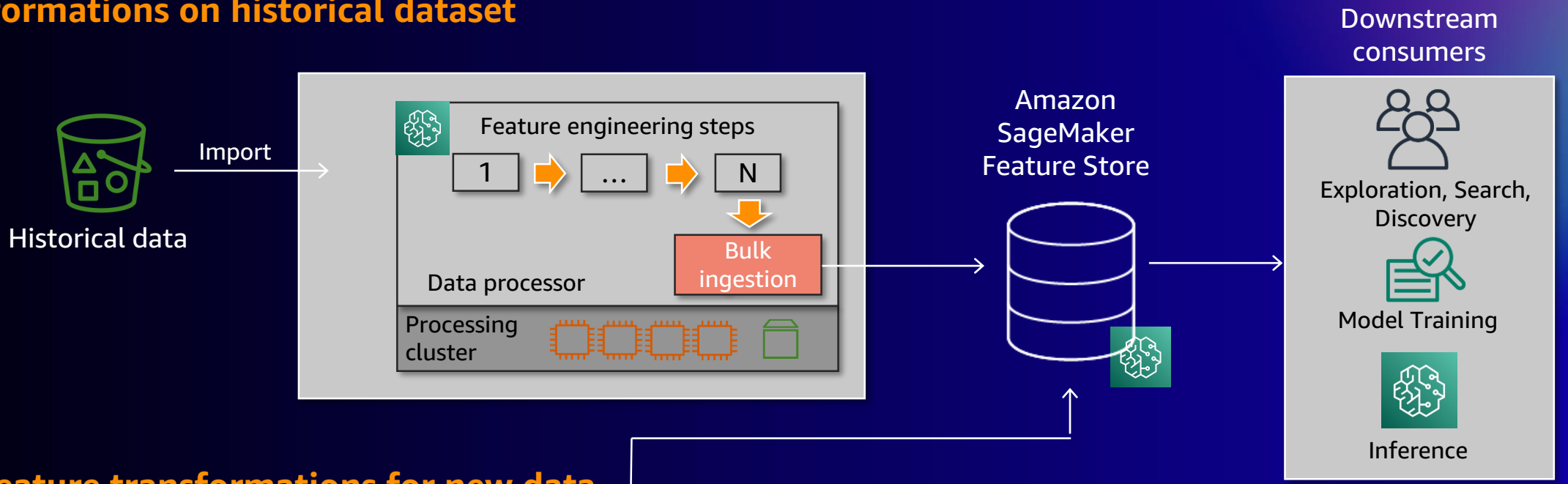
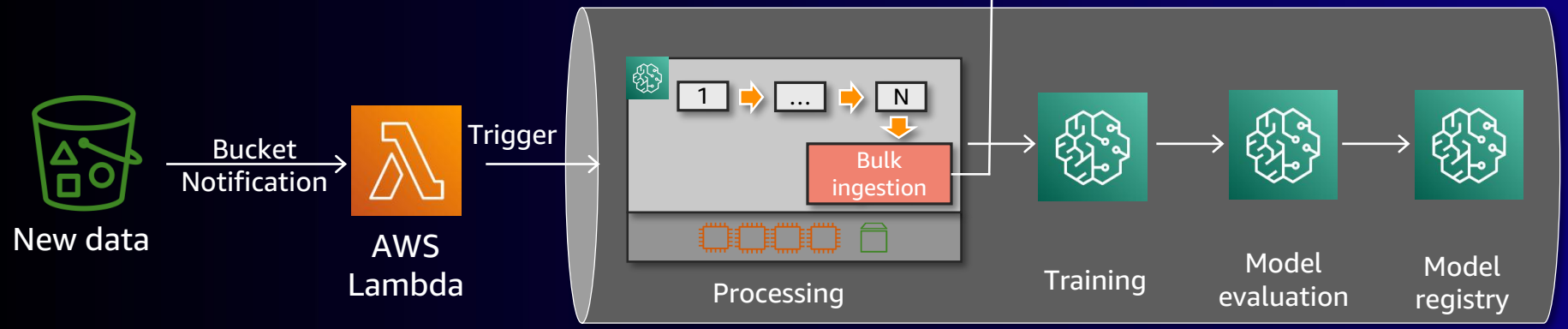
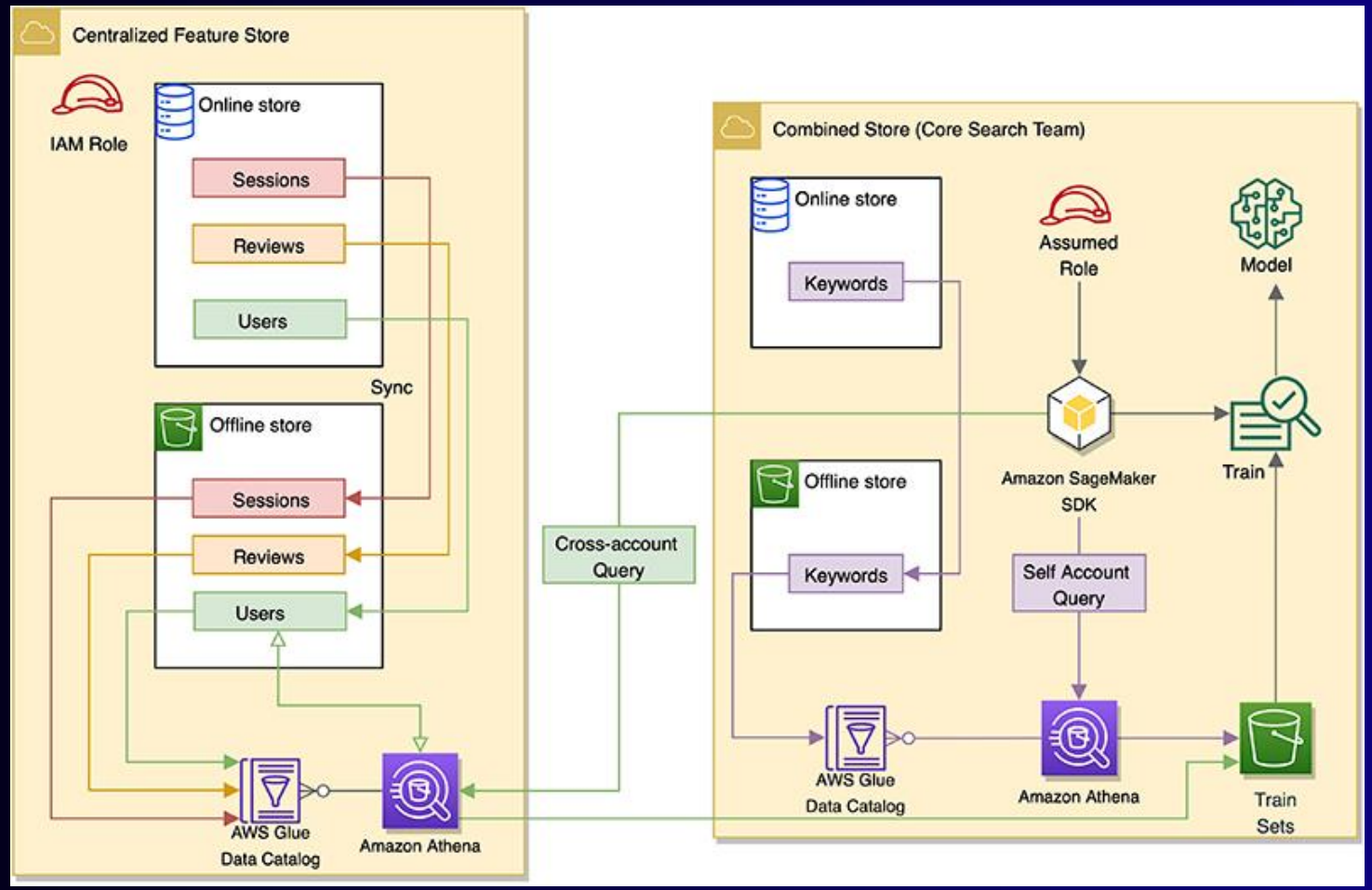


2. Automated feature transformations for new data

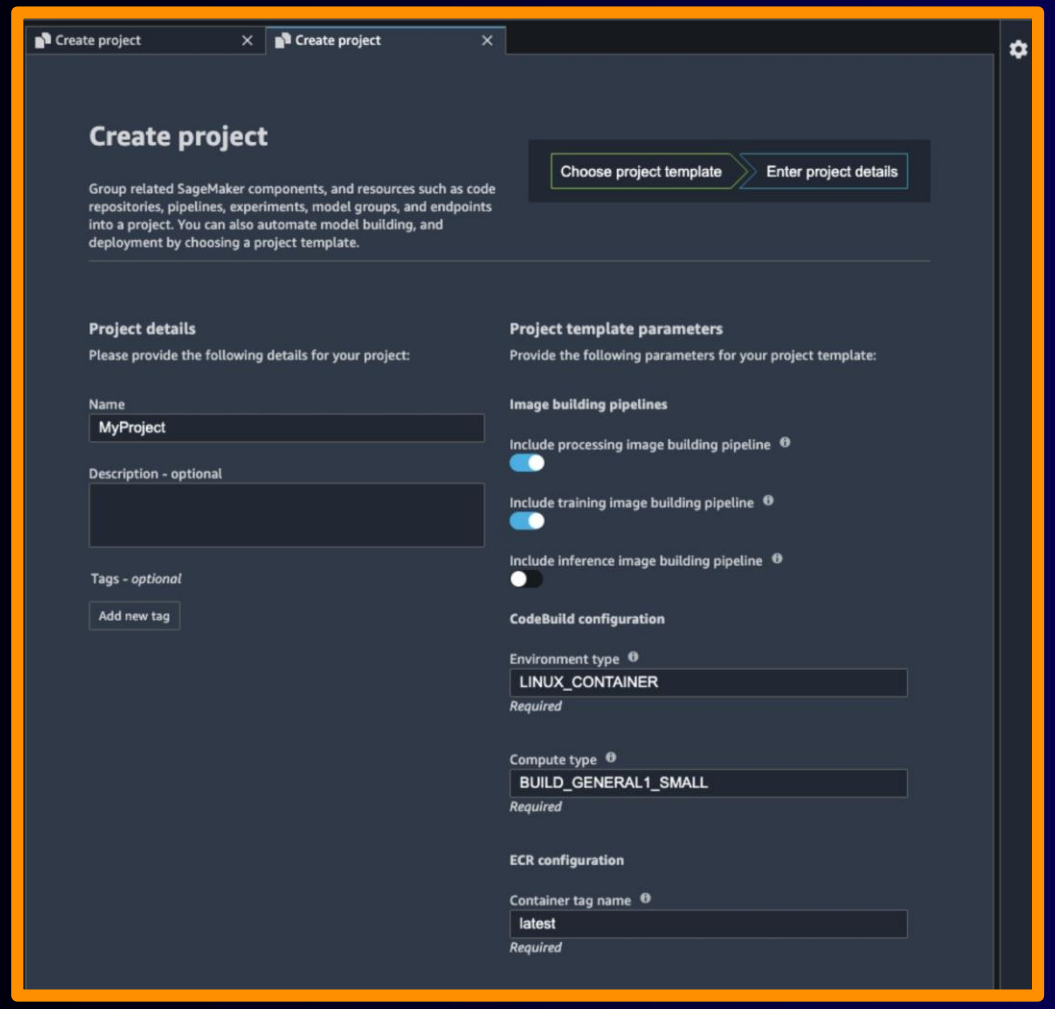


Enable feature reuse across accounts and teams using Amazon SageMaker Feature Store



Standardized self service environments with guardrails

Enable secure self-service provisioning for ML environments with Amazon SageMaker Projects



- Create best-practices templates with AWS CloudFormation or Terraform and turn into AWS Service Catalog products (immutable and secure)
- Create AWS Service Catalog products from best practices templates (immutable, secure)
- Enforce security controls, compliance, and cost tracking

Getting started with Amazon SageMaker projects

AWS Machine Learning Blog

Build Custom SageMaker Project Templates – Best Practices

by Kirit Thadaka and Durga Sury | on 27 OCT 2021 | in Amazon SageMaker, Artificial Intelligence | Permalink | Comments | Share

SageMaker Projects give organizations the ability to easily setup and standardize developer environments for data scientists and CI/CD systems for MLOps Engineers. With SageMaker Projects, MLOps engineers or organization admins can define templates which bootstrap the ML Workflow with source version control, automated ML Pipelines, and a set of code to quickly start iterating over ML use cases. With Projects, dependency management, code repository management, build reproducibility, artifact sharing and management become easy for organizations to set up. SageMaker Projects are provisioned using AWS Service Catalog products. Project templates are used by organizations to provision Projects for each of their users.

This post describes how SageMaker Project templates can be customized to fit any organization's use case. This GitHub repository contains examples of custom templates.

SageMaker Projects

Every organization has its own set of standards and practices that provide security and governance for their AWS environment. SageMaker provides a set of 1st party templates for organizations that want to quickly get started with ML workflows and CI/CD. Included in the templates are projects which use AWS native services for CI/CD such as AWS CodeBuild, AWS CodePipeline, and AWS CodeCommit and also projects that use third party tools such as Jenkins and GitHub.

Oftentimes organizations need tight control over the MLOps resources that are provisioned, restricted and managed; this includes – configuring IAM roles/policies, enforcing resource tags, enforcing encryption and decoupling resources across multiple accounts. To give organizations the flexibility to do this, SageMaker Projects support custom templates where organizations use AWS CloudFormation scripts to define the resources needed for an ML workflow. These custom templates are created as AWS Service Catalog products and provisioned as Organization Templates on the SageMaker Studio UI. This is where Data Scientists would choose a template and have their ML workflow bootstrapped and pre-configured. AWS Service Catalog is an AWS service that enables organizations to create and manage catalogs of products

blog link

AWS Machine Learning Blog

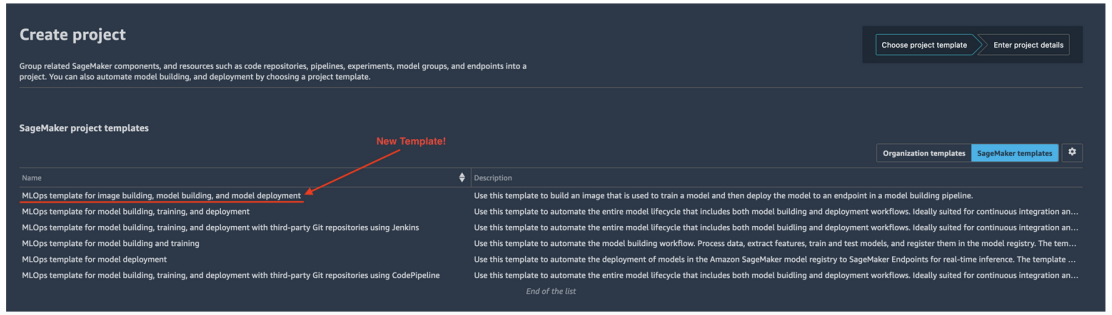
Create Amazon SageMaker projects with image building CI/CD pipelines

by Kirit Thadaka | on 30 SEP 2021 | in Amazon SageMaker, Artificial Intelligence, AWS Service Catalog | Permalink | Comments | Share

Amazon SageMaker projects are AWS Service Catalog provisioned products that enable you to easily create end-to-end machine learning (ML) solutions. SageMaker projects give organizations the ability to use templates that bootstrap ML solutions for your users to speed up the start time for ML development.

You can now use SageMaker projects to manage custom dependencies through an image building continuous integration and continuous delivery (CI/CD) pipeline that's available as a first-party template on Amazon SageMaker Studio. This new capability gives developers the flexibility to make updates to the images you use for training, processing, and inference by changing the container files in your project's source control repositories, which automatically triggers an image building pipeline. The template uses AWS CodeCommit as the code repository. You can use the newly created images in a SageMaker pipeline for processing, training, and inference.

The new template options are now available via the SageMaker Python SDK or within the Studio IDE, as shown in the following screenshot.

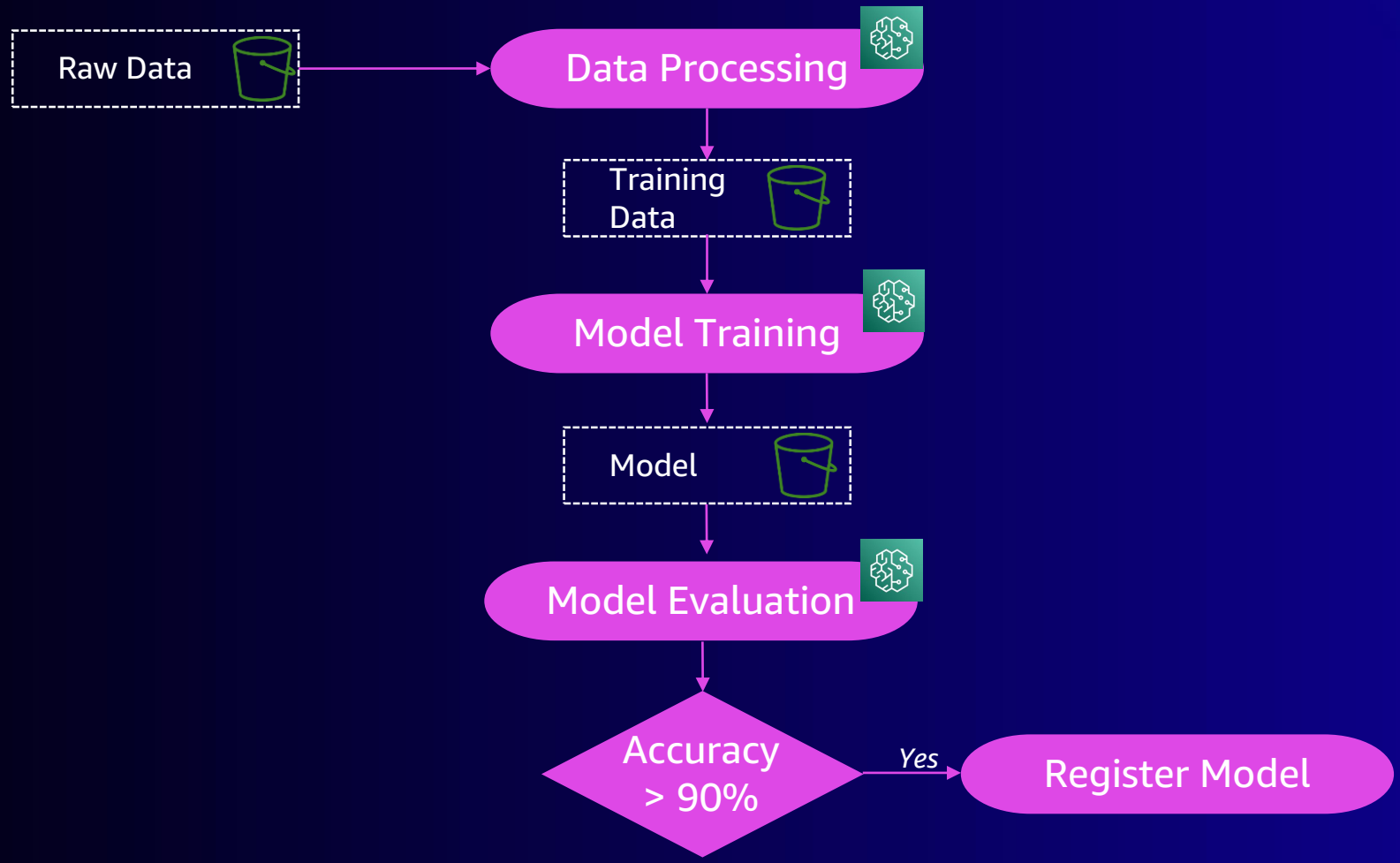


blog link

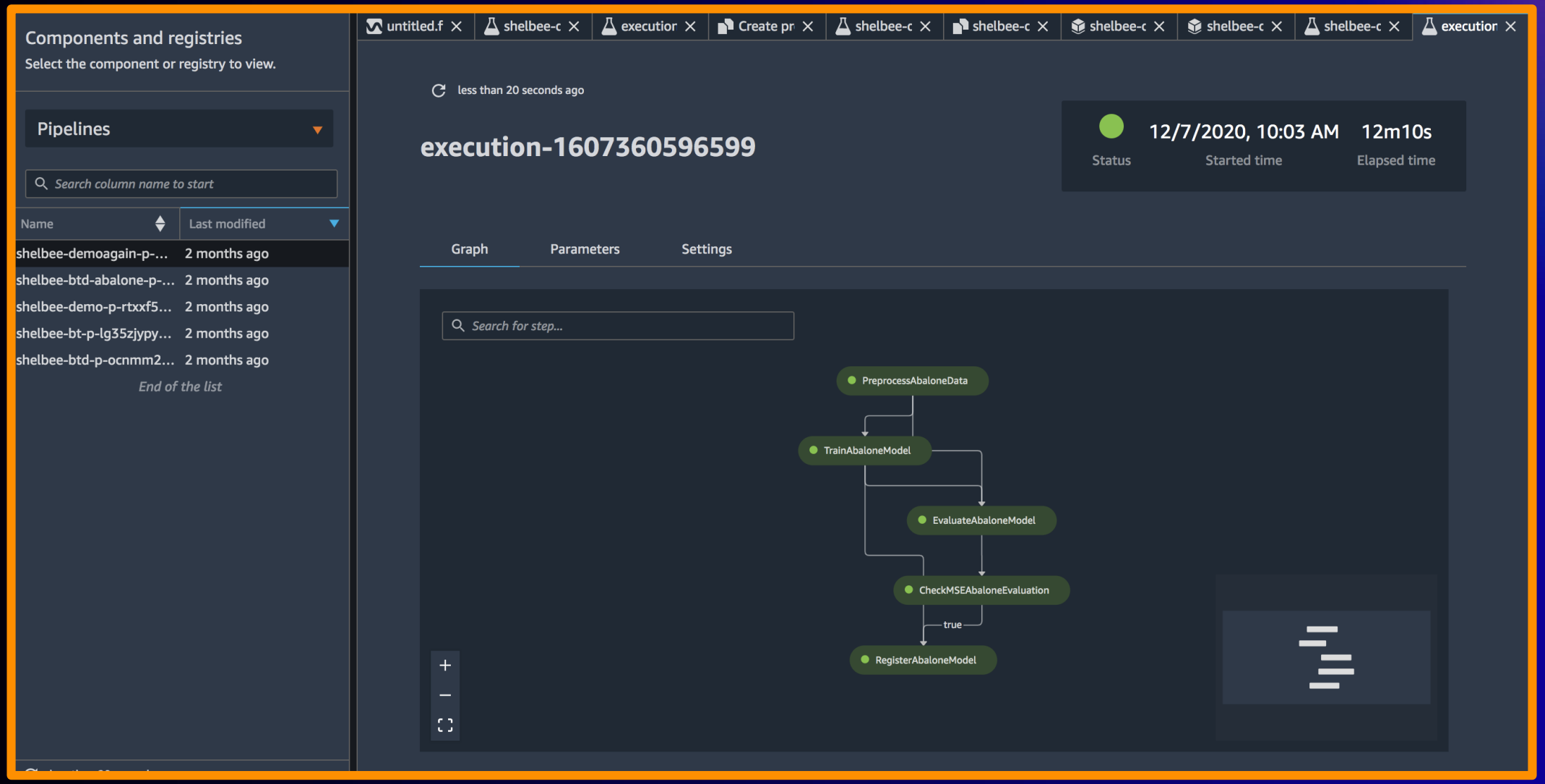
MLOps

MLOps with Amazon SageMaker Pipelines

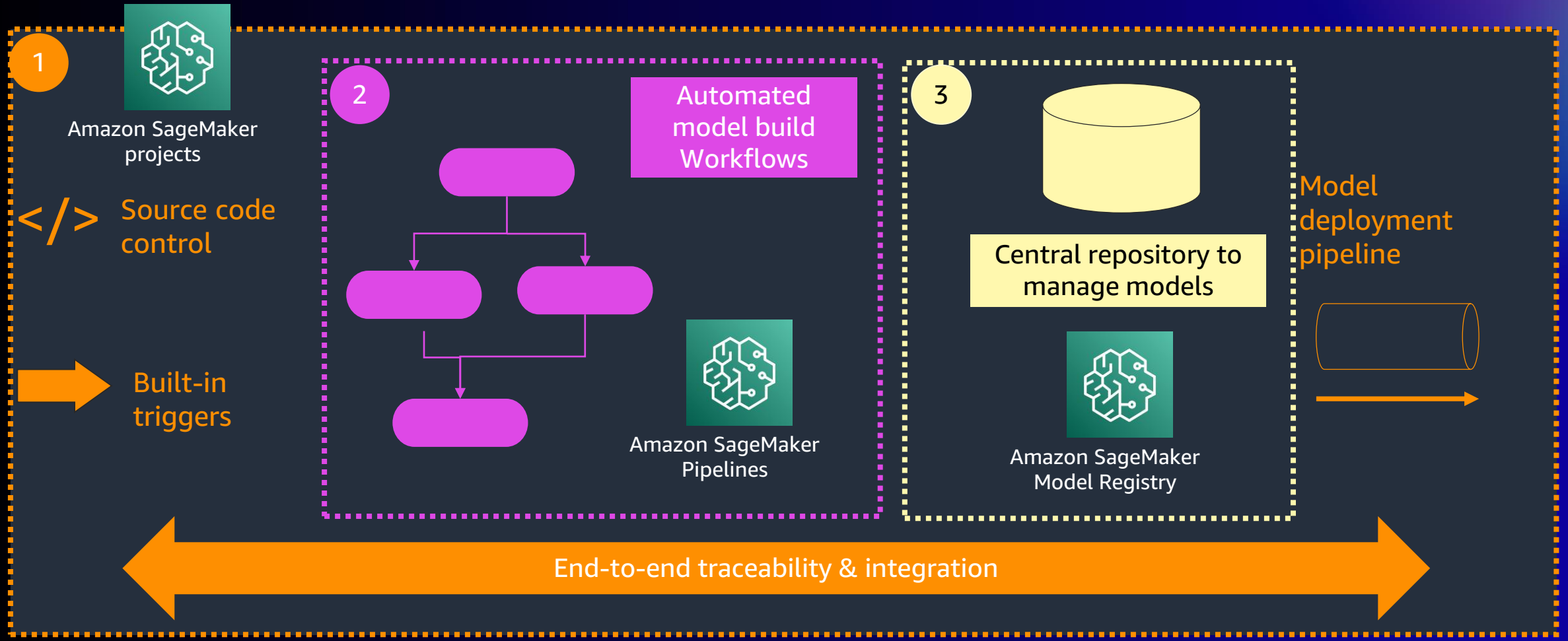
Example Workflow



Amazon SageMaker Pipelines

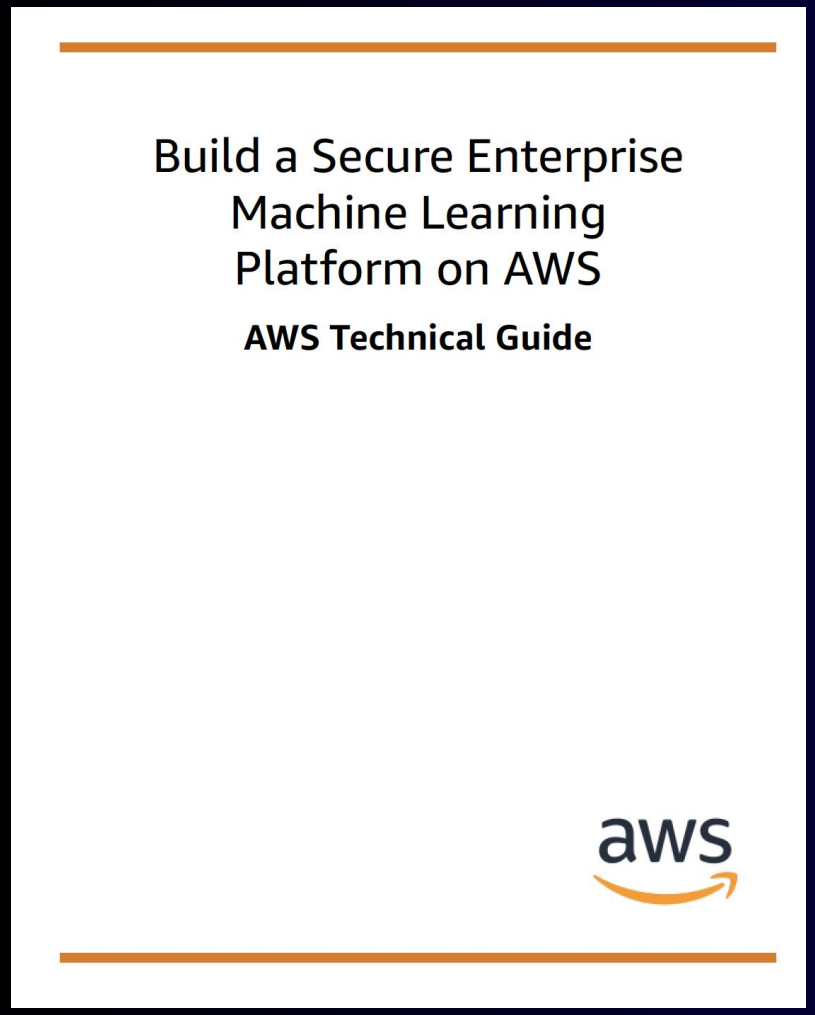


The complete picture

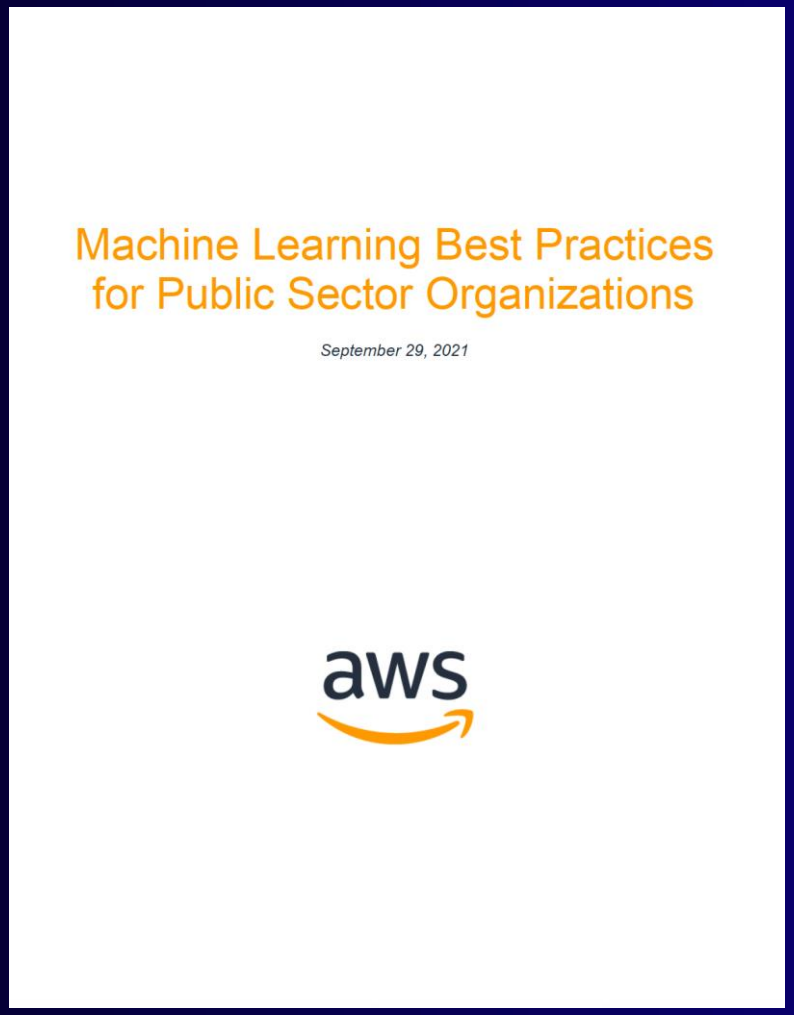


Key resources to help you get started

Whitepapers



whitepaper link



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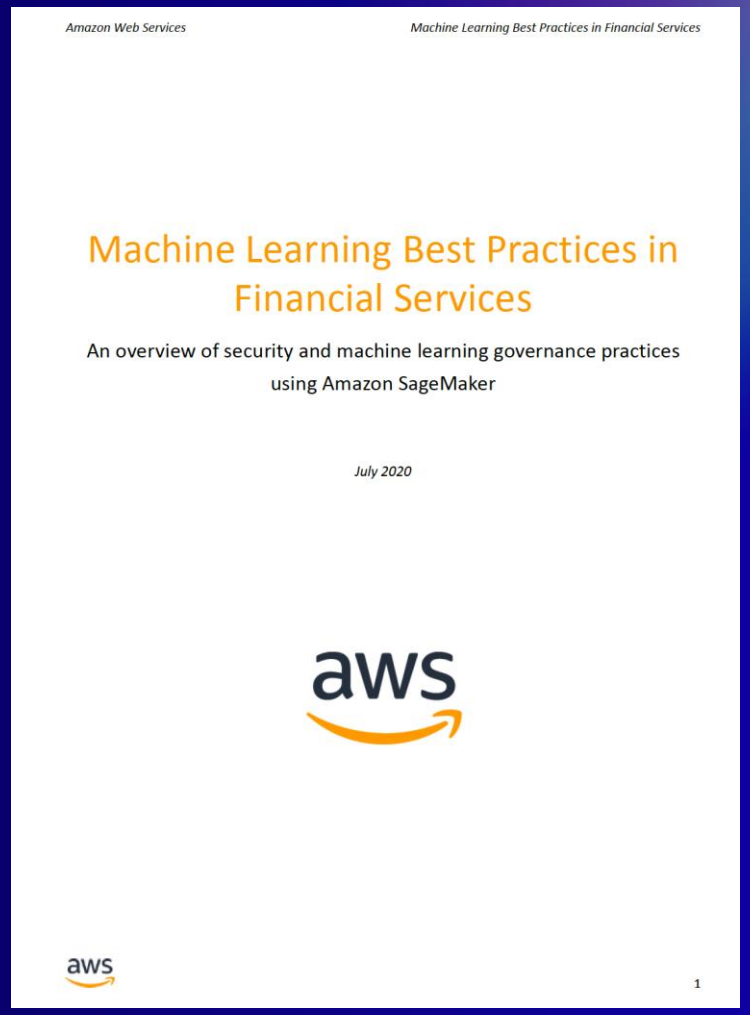
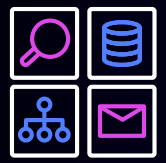


whitepaper link

aws

AWS resources to help

AI POC In A Box



AI Service Immersion Days

ML Solutions Lab

AWS Partner Network for AI / ML

...And much more

Visit the AI & Machine Learning resource hub for more resources

Dive deeper into these resources, get inspired and learn how you can use AI and machine learning to accelerate your business outcomes.

- The machine learning journey e-book
- 7 leading machine learning use cases e-book
- A strategic playbook for data, analytics, and machine learning e-book
  Accelerate machine learning innovation with the right cloud services & infrastructure e-book
- Choosing the right compute infrastructure for machine learning e-book
- Improving service and reducing costs in contact centers e-book
- Why ML is essential in your fight against online fraud e-book
- … and more!

https://bit.ly/3mwi59V

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Validate your expertise

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Thank you!

Natacha Fort