



# AWS Platform Integrations

Overview

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# Agenda

Partnership background and goals

Authentication and secure connectivity to AWS

Using data stored on AWS in our platform

Event-driven integrations (Salesforce  $\rightleftarrows$  AWS)

New developer tools

Live Demo

Q&A



# Salesforce and AWS Lead Their Categories



Magic Quadrant for Enterprise Low-Code Application Platforms



Magic Quadrant for Cloud Infrastructure and Platform Services



# Unify Your Developer Experience

Clicks-to-code tools for joint customers



## Simplify Authentication Across Clouds

Sign in to AWS from Salesforce Setup or into Salesforce from AWS to streamline governance between Salesforce and AWS



## Build Modern Apps Faster with AWS Data Sources

Speed up app development by virtualizing data on AWS for use within Salesforce objects for point-and-click development



## React in Real-Time with Event-Driven Solutions

Securely move customer data from Salesforce to AWS and business data from AWS to Salesforce using automated workflows



## Deploy Salesforce-optimized IDE in the Browser

Fast, web-based environment that supports all Salesforce frameworks to build how they want, from where they want



# Simplify Authentication

Connect to AWS from Salesforce securely

## Easily Authenticate with IAM Roles

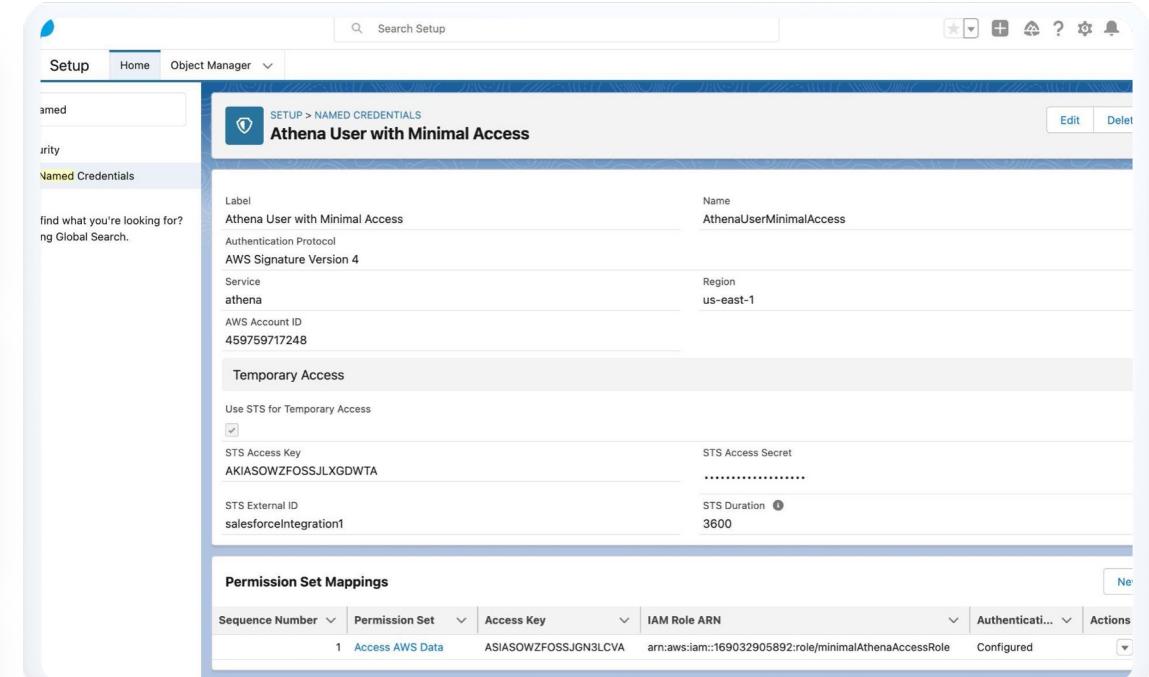
Leverage named credentials to manage connectivity into your AWS account, including assumption of IAM Roles

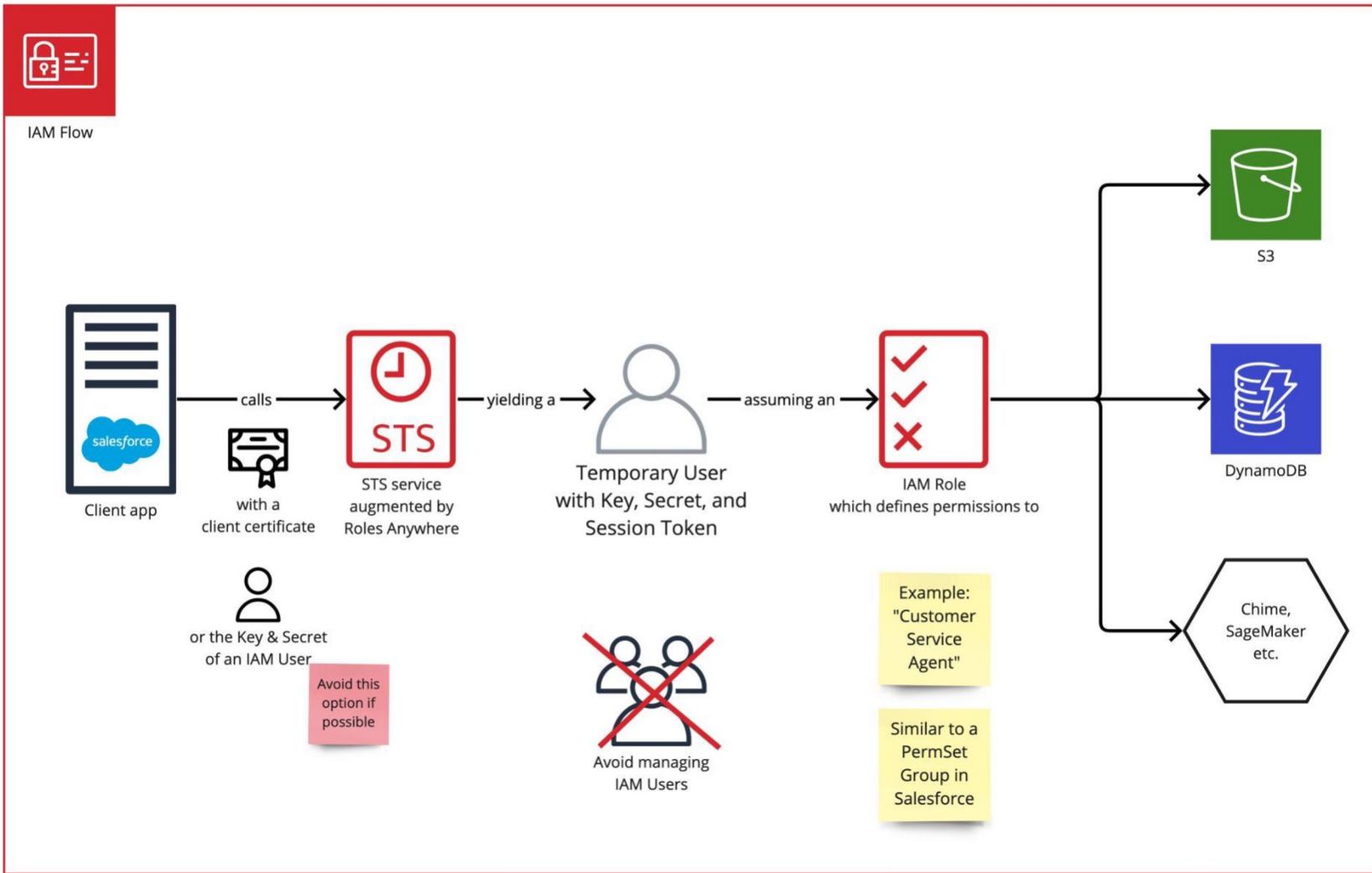
## Private Routing to AWS infrastructure

Avoid the public internet to maintain security and compliance  
(requires an additional license)

## Admin Friendly Setup

Allow users to access AWS services based on their permission sets in Salesforce





## Using IAM Roles

IAM Roles Anywhere lets customers use certificates to assume IAM Roles and avoids IAM User creation.

GA today!



# Private Connect

Private routing for API traffic between Salesforce and AWS to avoid the public internet



# Private Connect bypasses the public internet

Access isolated resources via a private tunnel for secure API integrations



- Services and resources can be isolated onto an “island” (VPC) for security and compliance
- Private Connect “digs a tunnel” to access them and provide private routing
- Delivered by a separate network infrastructure deployed at each instance (including Hyperforce)
- Requires use of Named Credentials
- Does *not* require any specific auth protocol; uses AWS PrivateLink



# Calling Out to AWS via Private Connect



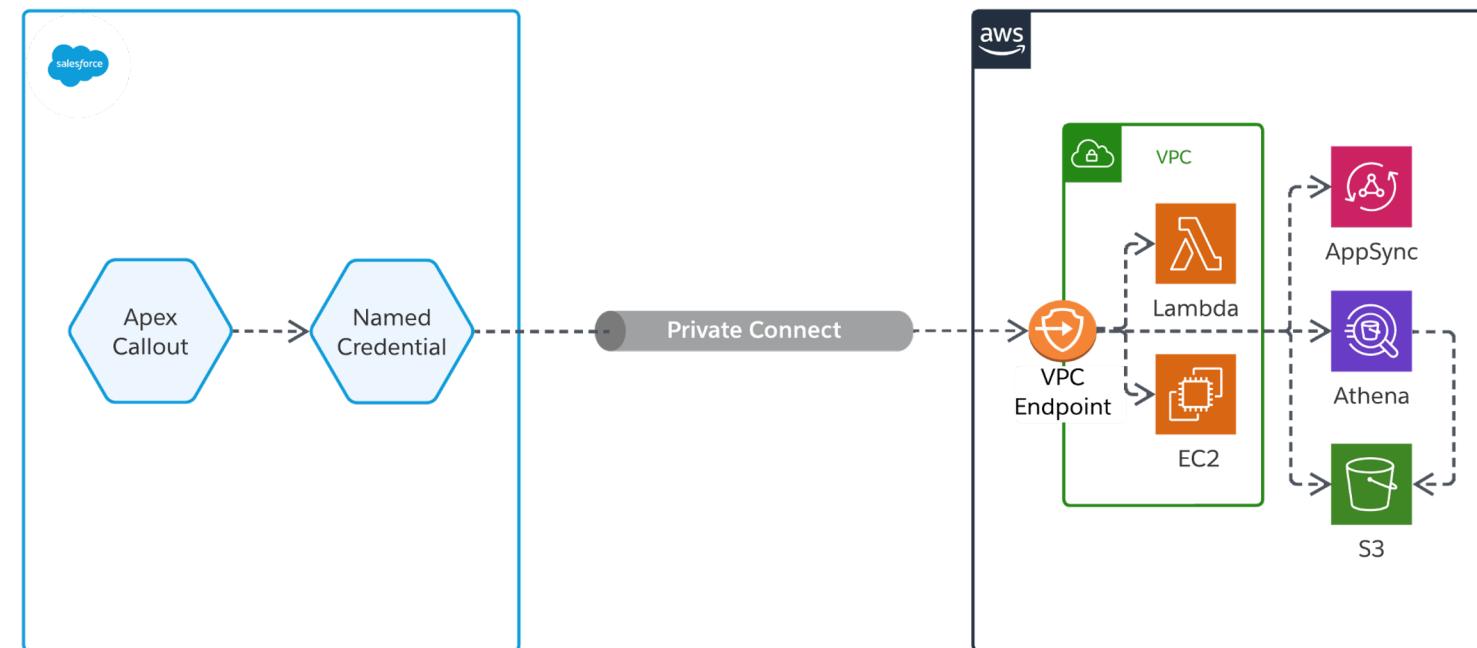
Value and customer benefit is focused on security and compliance

Custom services and apps are isolated in a VPC

Apex-based callouts can be made to those services via a private network route

AWS's managed services are not isolated in a customer's VPC (not in their control)

Callouts to AWS's services can be routed “through” the VPC for add'l security



# Contrasting AWS PrivateLink and Private Connect

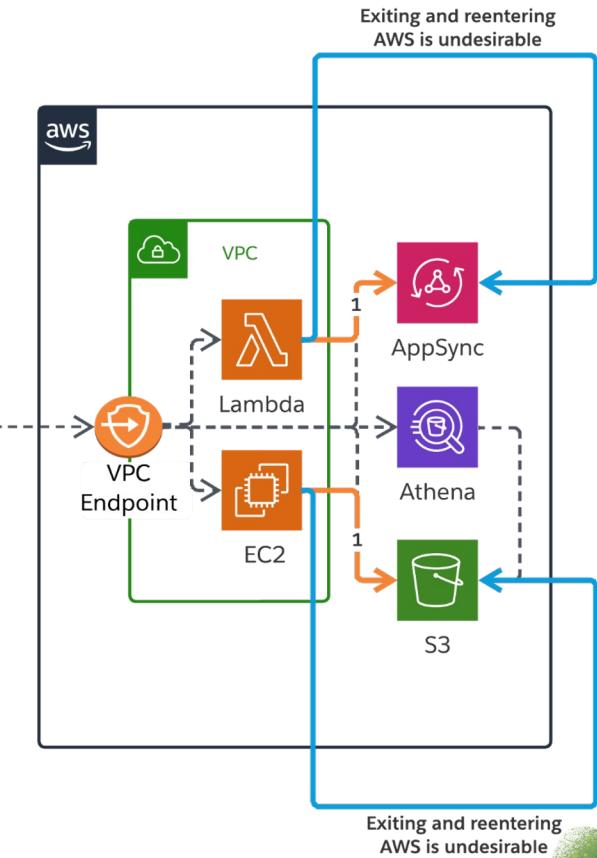
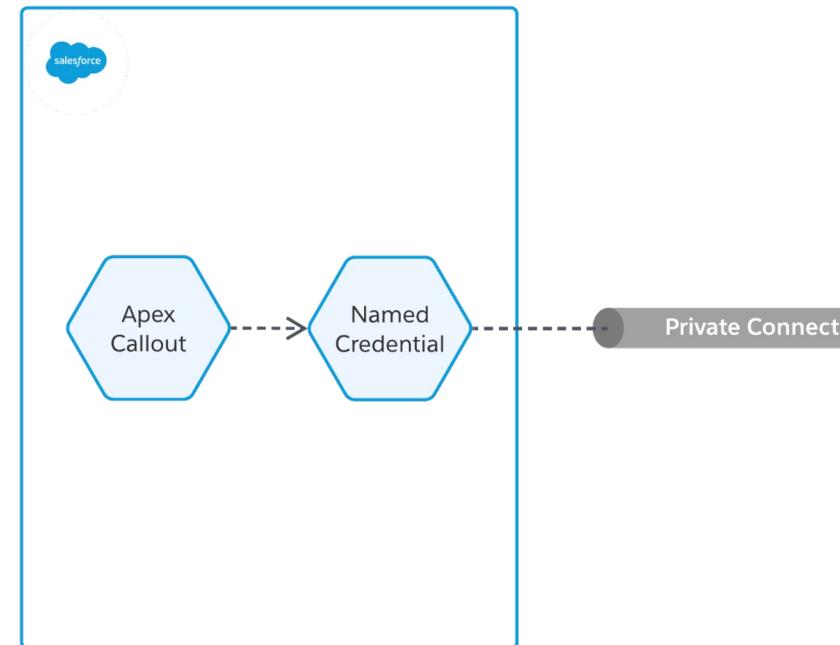


Performance is a larger focus for AWS PrivateLink

Custom services and apps  
isolated in a VPC need access to  
S3, etc.

Exiting and re-entering the  
AWS network is inefficient

PrivateLink addresses this via  
internal routes



1 Internal connections (via PrivateLink)  
are faster than exit and reentry



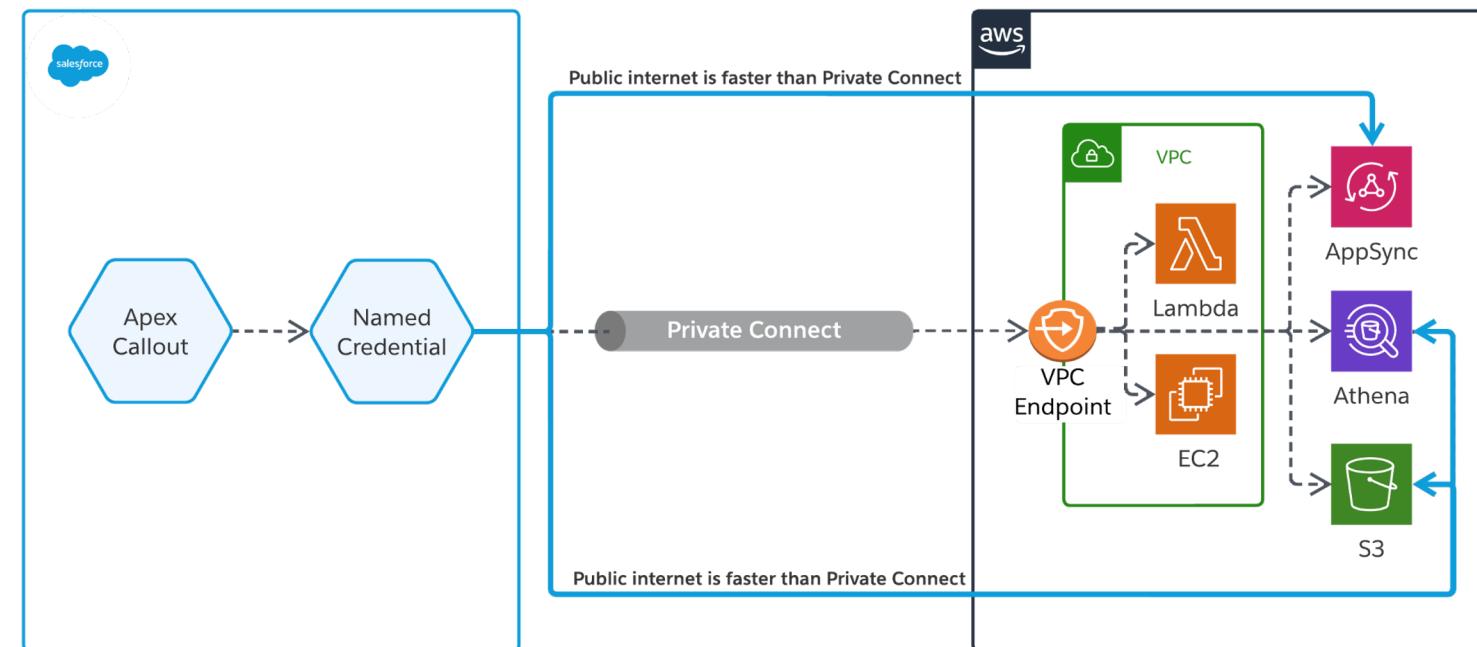
# Notes on Private Connect Performance



Salesforce and AWS both maintain very fast internet connections

Private connections are slower than the internet by a few percentage points

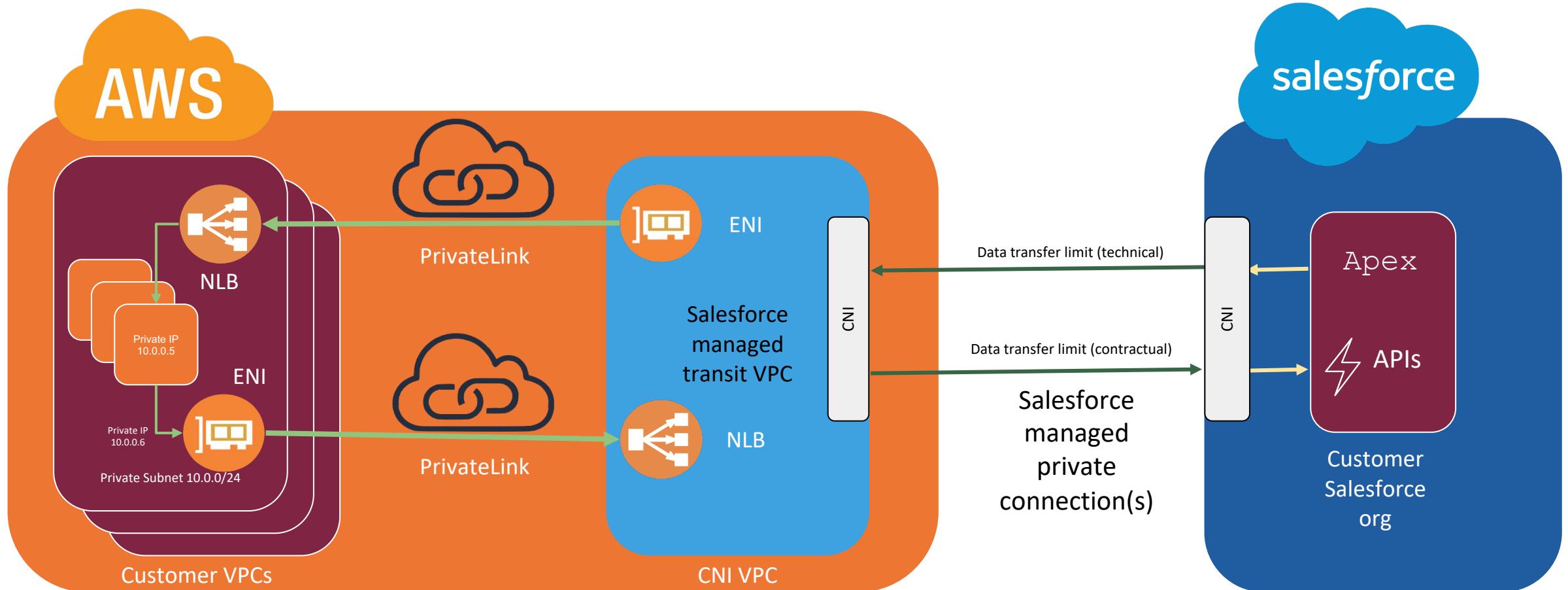
Private Connect *can* be faster than private network workarounds deployed by customers



# High-Level Architecture • Private Connect



Our transit VPCs act as a “middleman” to manage org migration, etc.



# Calling In to Salesforce from AWS



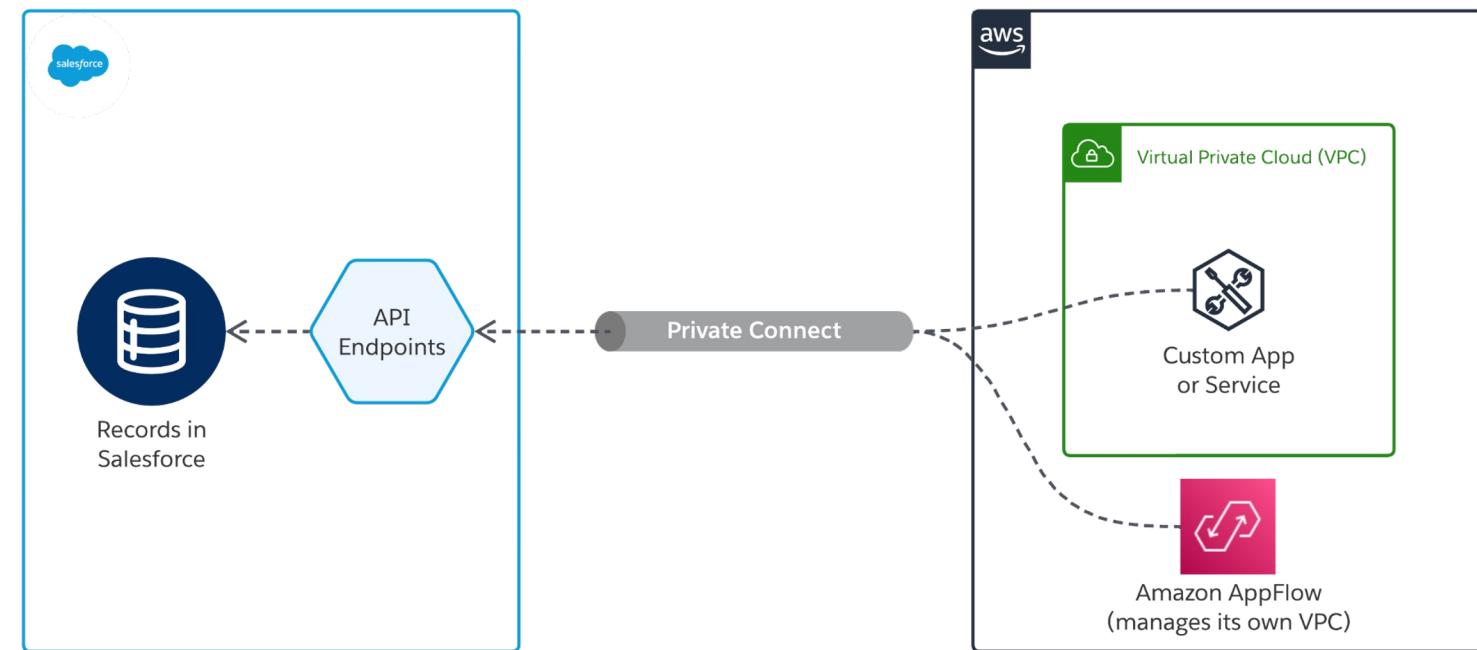
Common pattern for apps accessing standard Salesforce APIs

Custom services and apps isolated in a VPC can access Salesforce APIs as long as they have a network path

Typical use cases: loading in Leads, backing up data

Amazon AppFlow is a popular point and click tool to move data between apps

AppFlow's setup UI creates its own private connection, provided licenses exist



# Data Virtualization

Zero-copy access to AWS data from Salesforce





# Build New Creations with AWS Data

## Streamline Development

### Seamlessly Connect to AWS Data Services

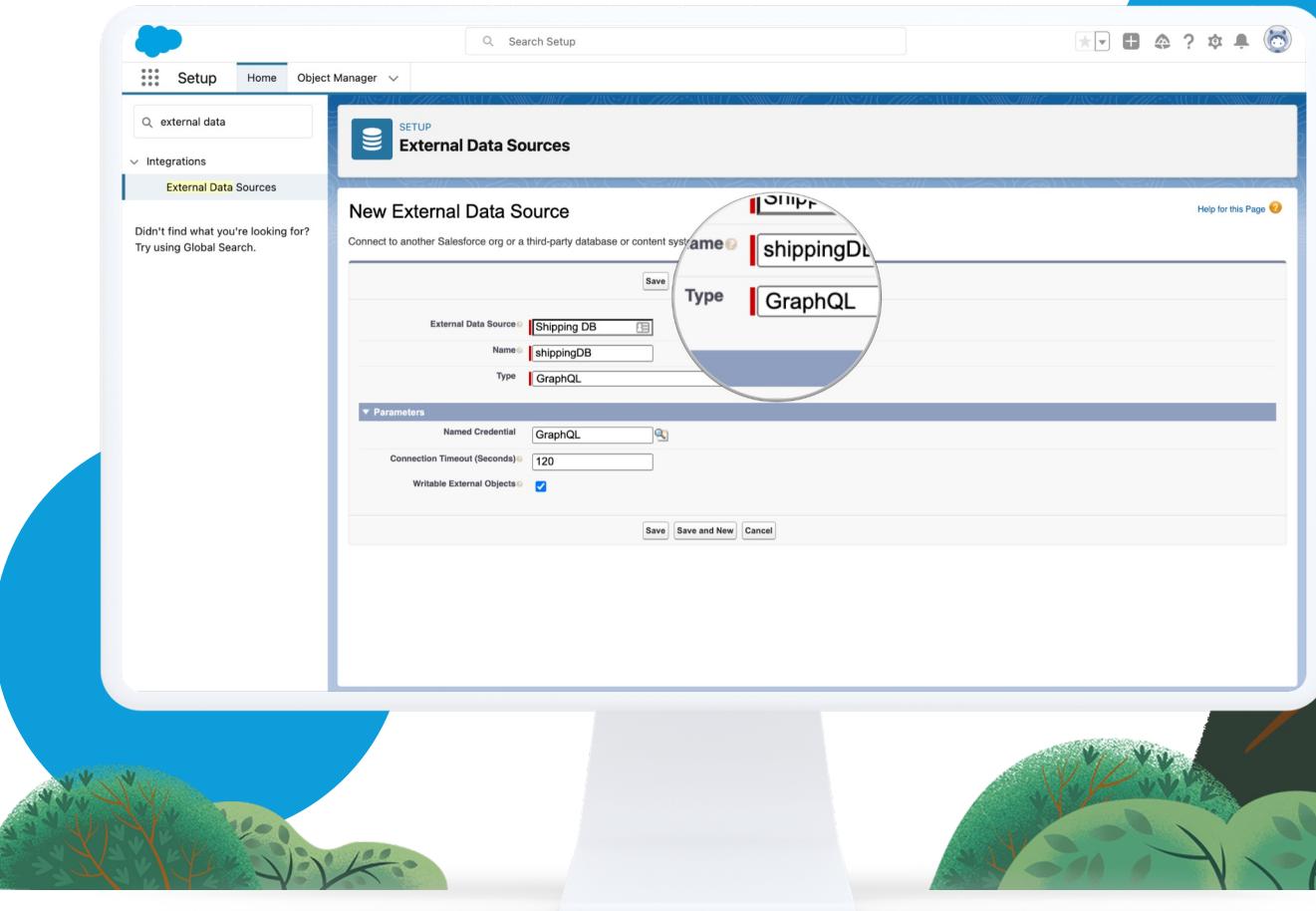
Get virtual (zero-copy) access to data from Amazon S3, DynamoDB, and RDS with new adapters for Salesforce Connect.

### Accelerate Joint Development

Utilize AWS data with Lighting App Builder and Flow Builder using point and click tools.

### Enable Salesforce DevEx on AWS Data

Interact with AWS data services just like other Salesforce Objects, including SOQL and Apex.

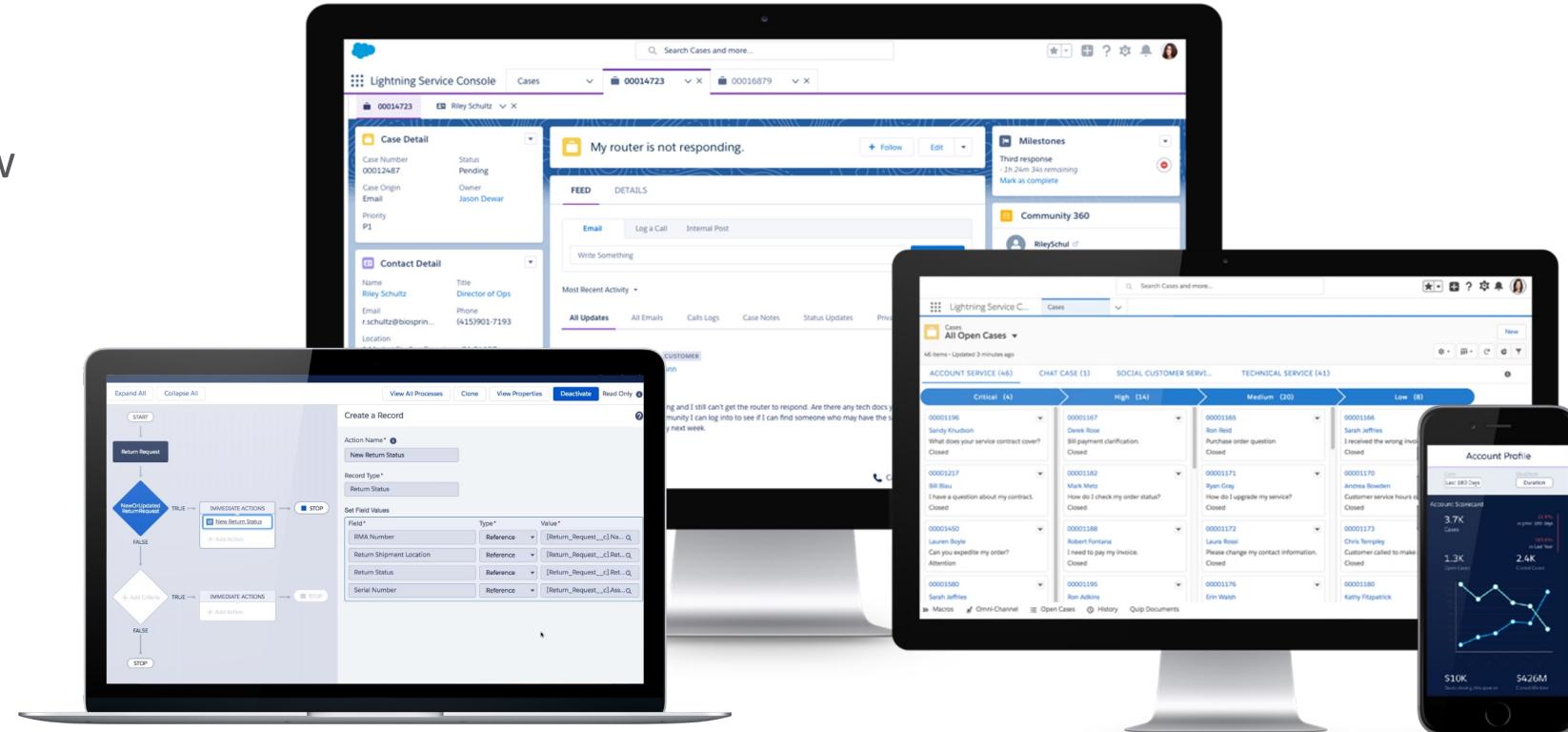


# Run Typical Operations on External Data



Common operations function the same as with native data

- Access data in the UI
- Relate data to native records for a 360° view
- Build Flows
- Provide mobile access
- Write SOQL and Apex
- Limitations: sharing, advanced reporting



# New Adapters Added to Salesforce Connect



Additional features, similar licensing

## Amazon DynamoDB

B2C scale data in a single table

Great for audit/history data

Read/write, but no Reporting<sup>†</sup>

## Amazon Athena

SQL querying against S3 et. al.

Great for operational data lakes

Read only, but Reporting is supported

## GraphQL

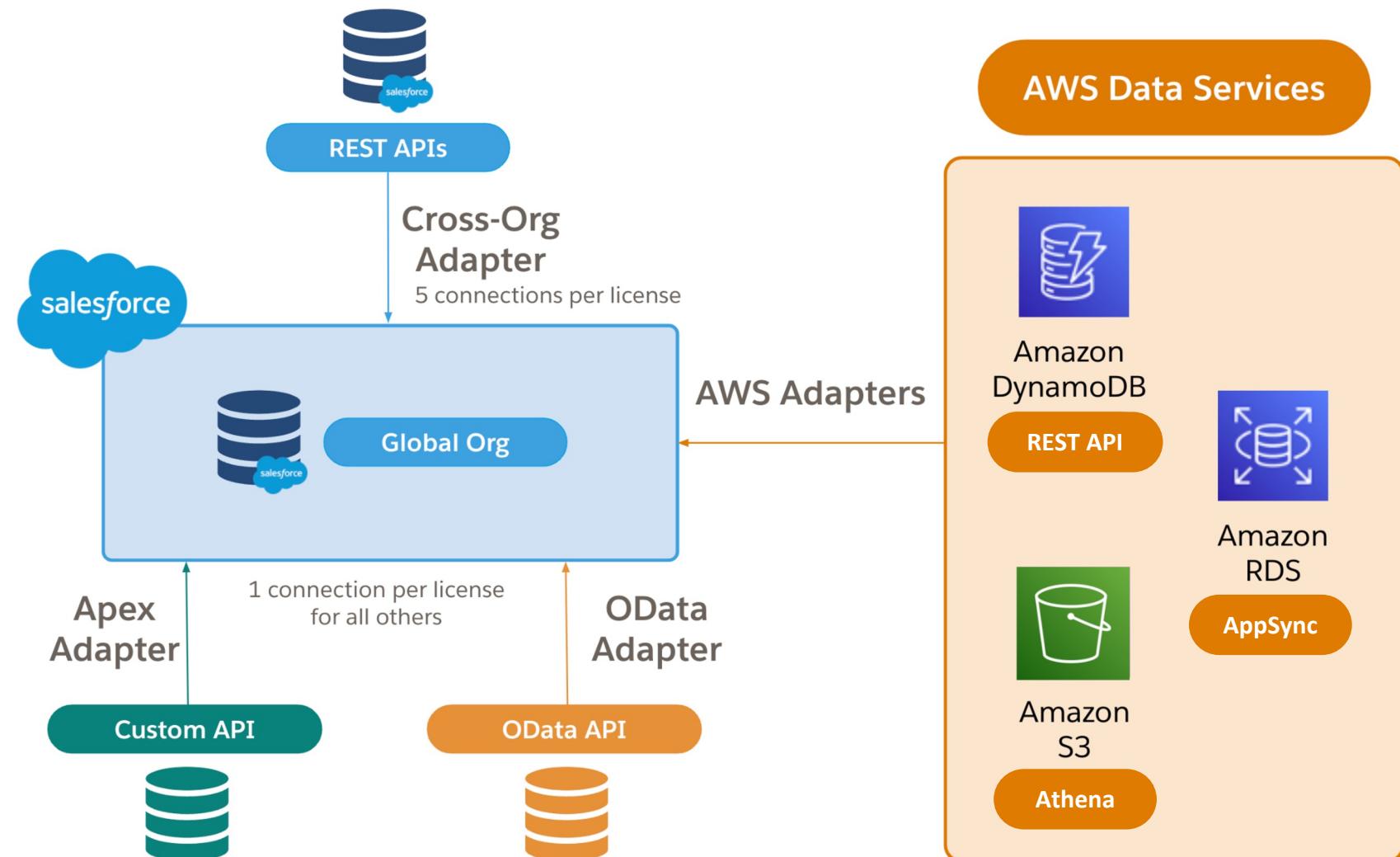
Provides access to RDS and more

Uses AWS AppSync to avoid JDBC

Setup template available for RDS

Read/write, Reporting supported

<sup>†</sup> NoSQL service does not offer full support for ORDER BY and WHERE clauses req'd for Reporting





# Salesforce Connect Adapter for Amazon Athena

Great for Sales/Service Cloud access to data  
lakes built on AWS





## Salesforce (SOQL)

Internal frameworks represent actions in our platform as one or more SOQL statements

Relational tables managed by Oracle/SDB

Transactional records

Both read and write capability, along with reporting

Granular sharing

Metadata is a key concept driving many capabilities

Data storage can be costly, especially at high volumes



## Athena/S3 (SQL)

Athena adapter translates SOQL to SQL, makes API requests to Athena's REST endpoint(s)

Relational tables backed by S3 files (CSV/JSON) or other sources

Data lakes serving multiple apps

Read only plus reporting (S3 writes are problematic)

IAM-based access ([example](#))

Sufficient metadata exposed to make setup straightforward

S3 is low cost, durable, and widely understood



# Salesforce Connect Adapter for Amazon DynamoDB

Fast read/write access to tables with billions of records



# Notes on the Amazon DynamoDB Adapter

Consider DynamoDB for high scale use cases

- Consistently good performance with billions of records in a given table (e.g. Amazon.com)
- Great for audit history tables

NoSQL architecture (no strict schema)

- Setup wizard helps deduce the implied schema

Read and write data from within Salesforce

- Reports and Dashboards not supported

New capability to create “virtual” columns using

Salesforce formulas

- Important for single-table designs

Ada  
Customer Care Specialist

Order Number	Account	City	State/Province	Order Date
1 10594	Old World Delicatessen	Anchorage	AK	1/3/2022
2 10653	Frankenversand	München	NULL	9/2/1997
3 10620	Laughing Bacchus Wine Cellars	Vancouver	BC	8/5/1997
4 10455	Wartian Herku	Oulu	NULL	2/24/1997
5 10911	Godos Cocina Tápica	Sevilla	NULL	2/26/1998
6 10347	Familia Arquibaldo	Sao Paulo	SP	11/6/1996
7 10961	Queen Cozinha	Sao Paulo	SP	3/19/1998
8 10973	La corne d'abondance	Versailles	NULL	3/24/1998
9 10532	Eastern Connection	London	NULL	5/9/1997
10 10856	Antonio Moreno Taquería	México D.F.	NULL	1/28/1998
11 10984	Save-a-lot Markets	Boise	ID	3/30/1998
12 10709	Gourmet Lanchonetes	Campinas	SP	10/17/1997
13 10417	Simons bistro	Kopenhagen	NULL	1/6/1997
14 10656	Great Lakes Food Market	Eugene	OR	9/4/1997
15 10550	Godos Cocina Tápica	Sevilla	NULL	5/28/1997
16 10985	Hungry Owl All-Night Grocers	Cork	Co. Cork	3/30/1998
17 10593	Lehmanna's Marktstand	Frankfurt a.M.	NULL	7/9/1997
18 10260	Ottilies Käseladen	Köln	NULL	7/19/1996
19 11030	Save-a-lot Markets	Boise	ID	4/17/1998

# Considerations for DynamoDB

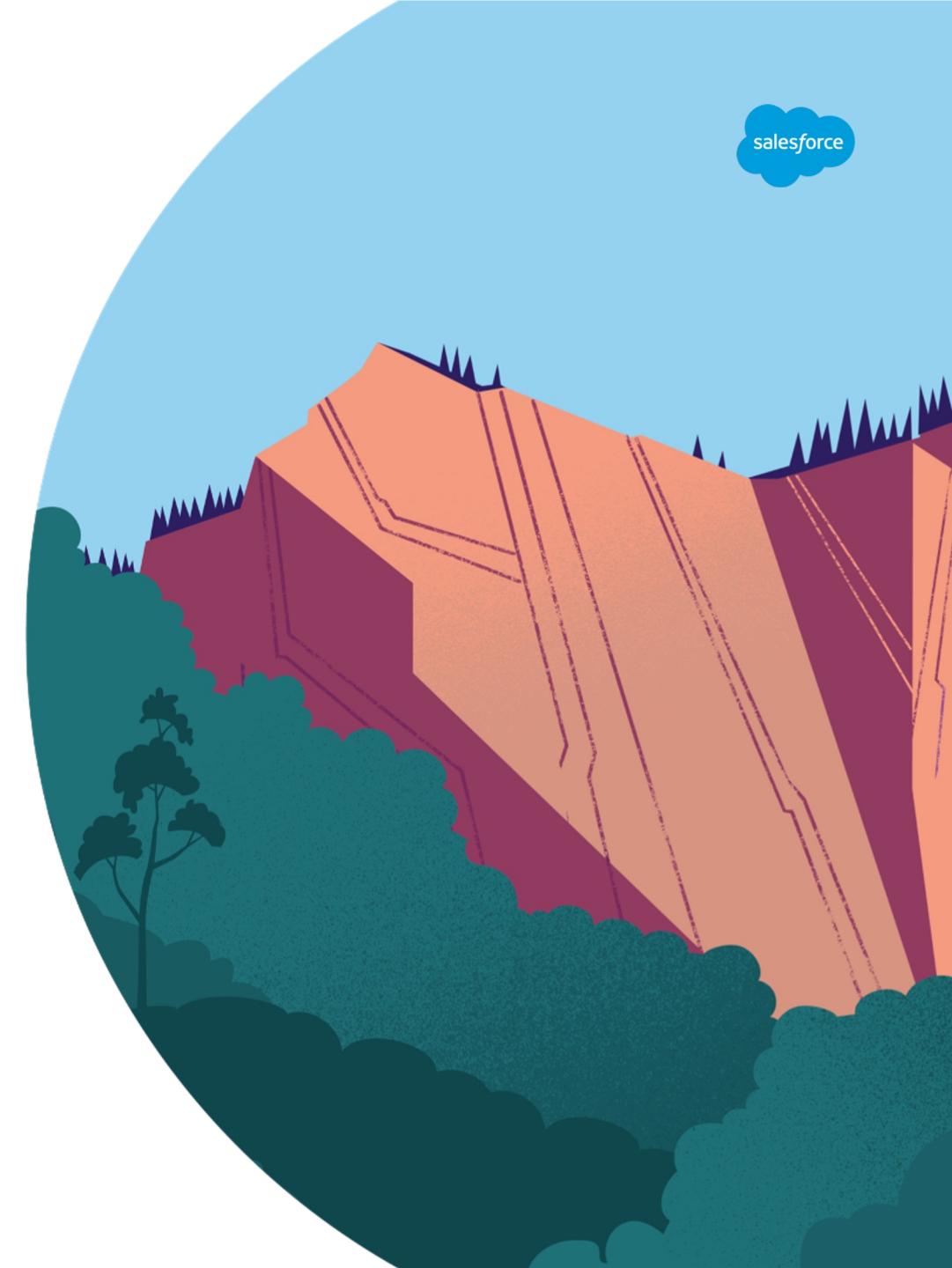
Trade-offs maintain performance at scale

Salesforce Reports and Dashboards are not supported

- DynamoDB does not support SQL-style JOINs

“Access-first” design is a new approach to data modeling

- Imagine knowing **every** query you will write **before** you create the table
- Not every access pattern is feasible in Salesforce
- Sorting often requires [additional indexes in DynamoDB](#)
- Store all data for an application in a single table (single-table design)
- Check [this GitHub repo](#) for more on single-table design





# Salesforce Connect Adapter for GraphQL

Access Amazon RDS using GraphQL via Amazon AppSync

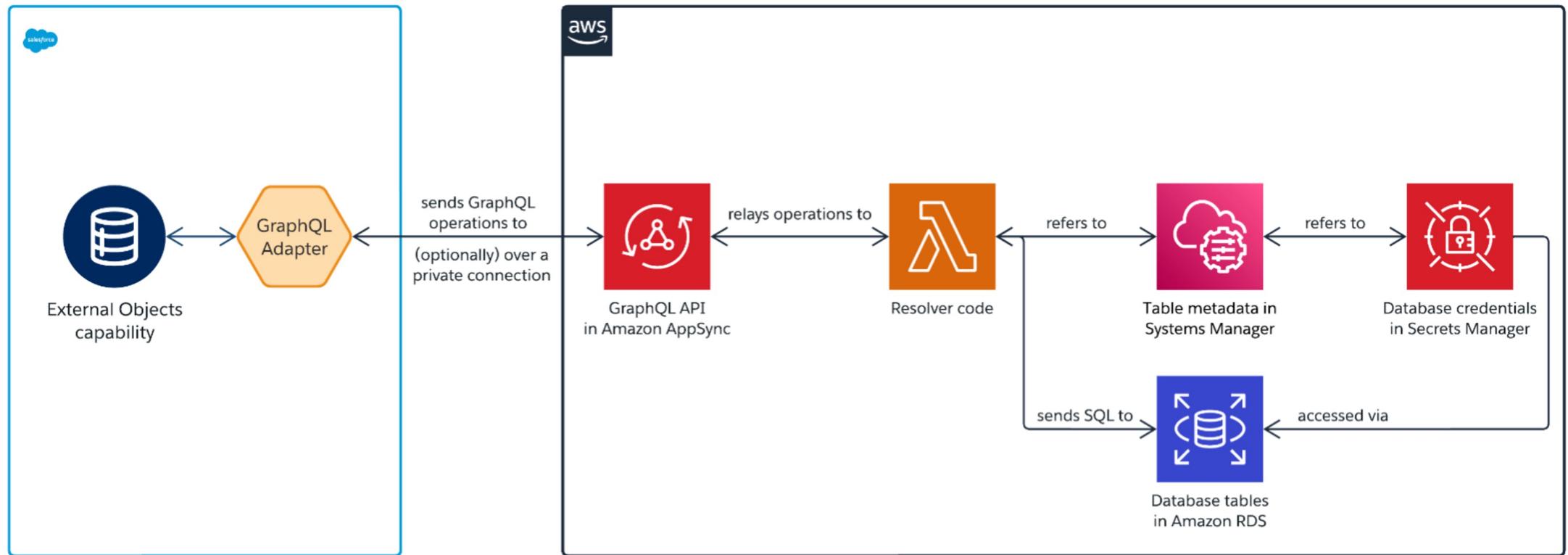


# Using Amazon AppSync to Query RDS via GraphQL



AppSync and GraphQL avoids JDBC, opens up future possibilities

CloudFormation resources are available to help address AWS setup concerns

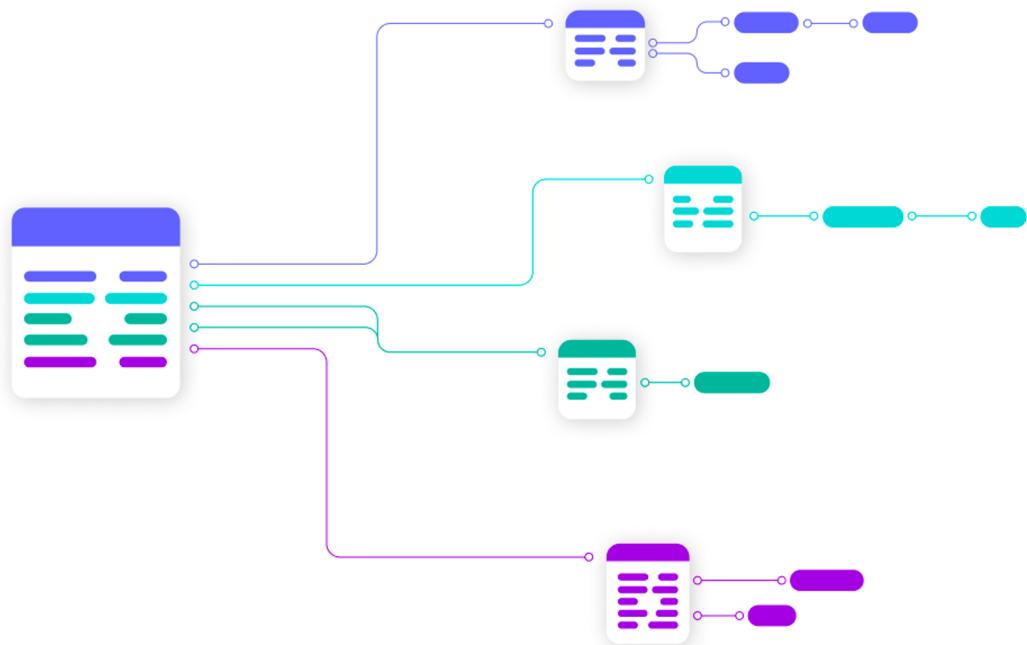


# GraphQL: We're Just Getting Started

Amazon RDS is only the beginning

**Today**, we have a tested, robust solution for RDS.

**Later**, we'll add extensibility for MuleSoft DataGraph, other popular providers, and custom endpoints.



*Imagine the possibilities with access to aggregated GraphQL endpoints...*





# Bi-Directional Eventing



# Increase Agility with Bi-Directional Eventing



## Enable Bi-directional Events

Select the events to push from Salesforce to AWS, and vice-versa using declarative tools

## Deliver End-to-End Experiences

Publish Platform events to AWS to leverage a suite of AWS functionality, and subscribe from AWS event bus

## Action Across Platform Events

Unified DevEx tools to publish events from Flows, or invoke Flows from events to interact with AWS services

A screenshot of the Salesforce Platform Events setup interface. At the top, it shows a Platform Event named 'Carbon Comparison'. Below this, the 'Platform Event Definition Detail' section lists various properties: Singular Label (Carbon Comparison), Plural Label (Carbon Comparisons), Object Name (Carbon\_Comparison), API Name (Carbon\_Comparison\_e), Event Type (High Volume), Publish Behavior (Publish After Commit), and Created By (Admin User, 8/11/2022, 2:24 PM). To the right, there are fields for Description, Deployment Status (Deployed), and modified dates. The main area shows a 'Standard Fields' section with a configuration pane for an 'EventBridge (CloudWatch Events)' trigger. This pane includes fields for Function ARN (arn:aws:lambda:us-west-2:84393843794:function:FCD\_Example) and Function URL. At the bottom, there's a 'Code source' tab with a code editor containing the following JavaScript code:

```
index.js
1 exports.handler = async (event) => {
2   // TODO implement
3   const response = {
4     statusCode: 200,
```

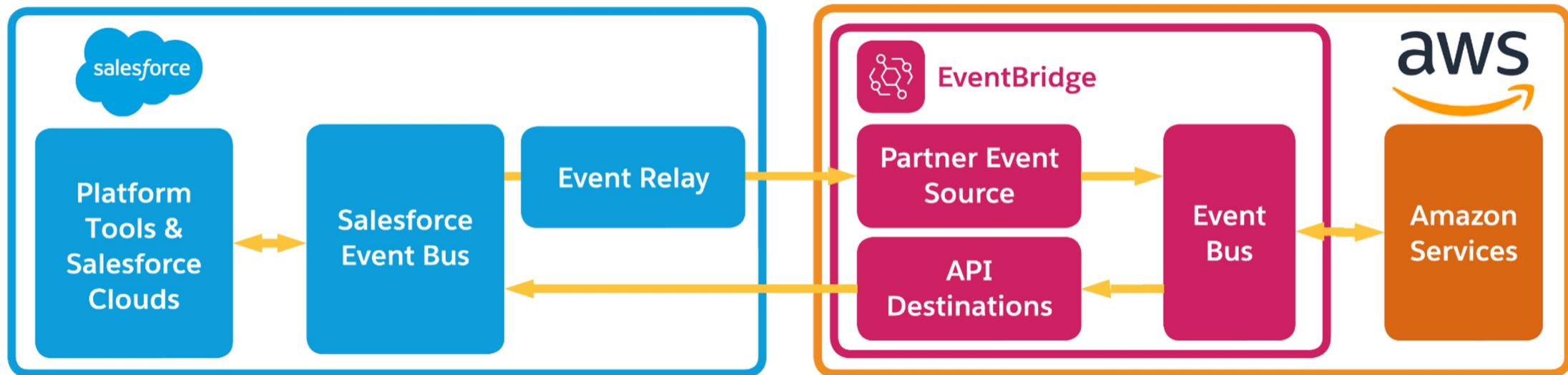
# Eventing Simplified

Join the Relay Race



Leverage the scale and speed of event driven integration faster than ever:

- **Event Relay** natively delivers events to **Amazon EventBridge**
- Publish events back to Salesforce via EventBridge's API Destinations
- Bi-directional event integrations with **no custom code or middleware**



# Creating Event Relays

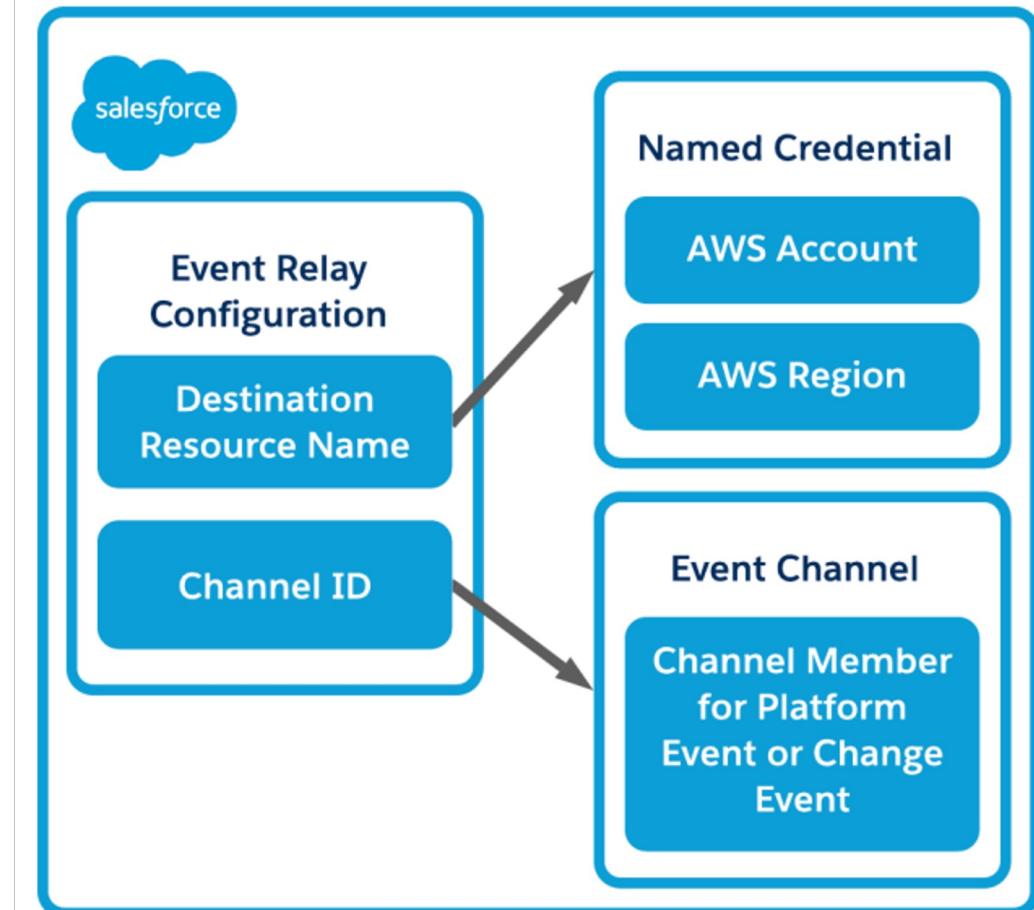
End to End Integration in Minutes



Event Relays are created via the Tooling API or Setup. All you need is:

- **Named Credential** for your AWS Account & Region
  - Relay events to multiple AWS Accounts & Regions
- **Platform Event Channel** you want to relay

Event Relays Create a Partner Event Source in EventBridge



# Relay Recap

Build fast with zero developers, for zero dollars



## No Code

needed to build and maintain AWS integration

Free up Developers

## \$0

Relay for free

Free Up Business Funds

## 10 mins

to create AWS integration

Innovate Fast





# Code Builder





GA today!



# Salesforce Code Builder

Build from anywhere, any way, with a modern, web-based dev environment

## Deploy a Salesforce-optimized IDE in the Browser

Fast, web-based environment that supports all Salesforce languages and frameworks - LWC, Aura, Apex, Visualforce

## Boost Productivity with Key Developer Workflows

Run scripts and build with modern developer workflows like CI/CD & source-driven development

## Develop with a Consistent, Familiar Experience

Utilize the same backend features as VS Code for rich code-completion, refactoring, & other key developer features

The screenshot shows the Salesforce Code Builder interface. On the left is an Explorer sidebar with project files like .css, .slds, .vscode, config, force-app/main/default, and various components like applications, aura, classes, contentassets, flexipages, layouts, lwc, objects, permissionsets, staticresources, tabs, triggers, scripts, .eslintignore, .flowignore, .gitignore, .prettierignore, .prettierrc, account.sql, code-builder-vscode-0.1.5.vsix, jest.config.js, package.json, README.md, and sfdx-project.json. The main area has tabs for 'Code Builder Guide' and 'account.sql'. The 'account.sql' tab contains an SOQL query: 

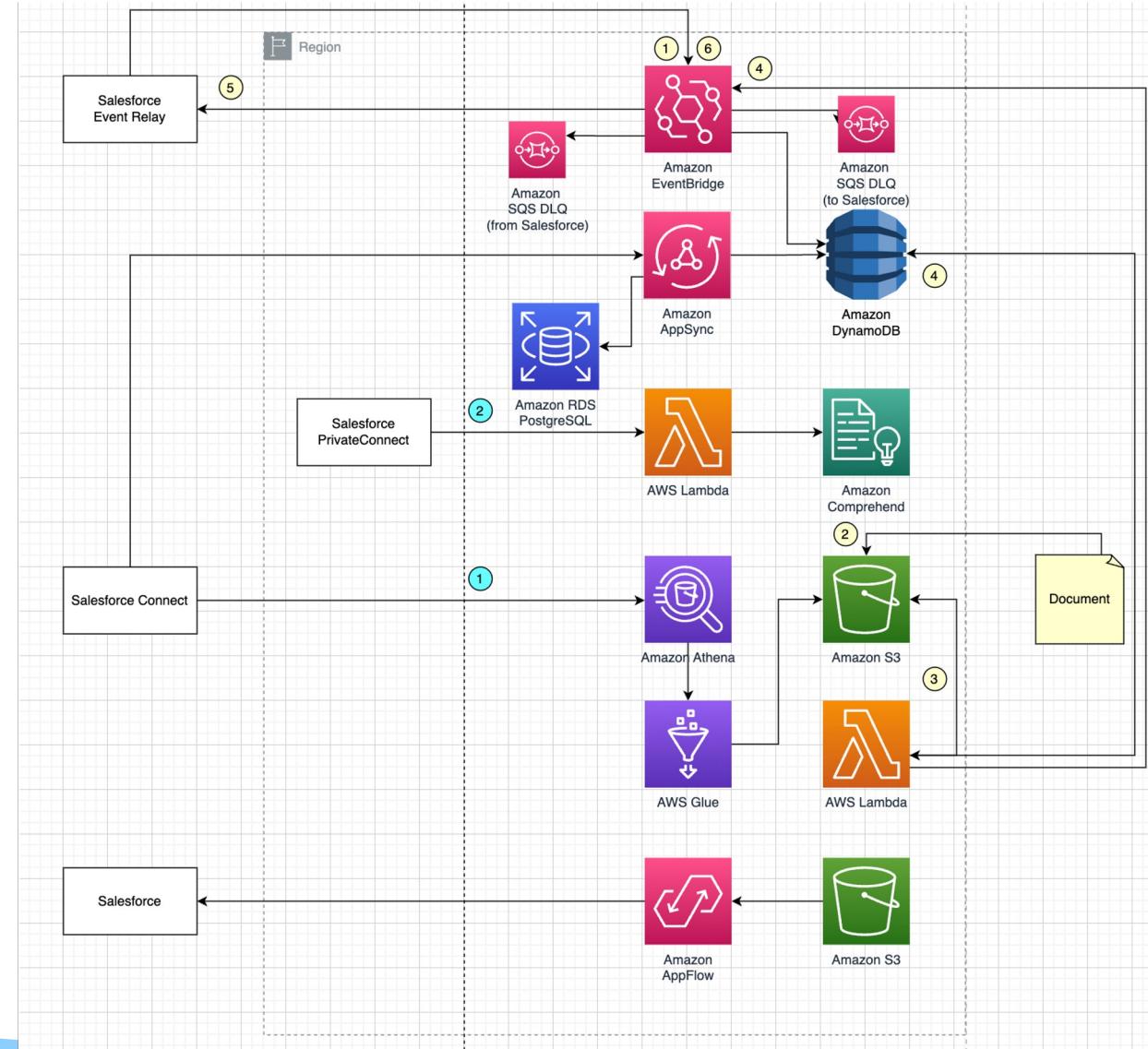
```
SELECT Name, AccountNumber, Type, BillingCountry, NumberOfEmployees  
FROM Account  
WHERE NumberOfEmployees > 5  
ORDER BY Name ASC NULLS LAST
```

. Below the query are sections for 'From', 'Fields', 'Filter', and 'Order By'. To the right is a 'SOQL Query Results' table titled 'account.sql' with 11 records. The columns are Name, AccountN..., Type, BillingCou..., and NumberOf... The table includes links for .csv and .json export. At the bottom are navigation buttons: First, Prev, 1, Next, Last.

powered by



# Demo Scenario Architecture



salesforce

# Thank you

