AWS re:Invent

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DAT309

Enrich your database with location intelligence

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Agenda

- Geospatial enrichment
- Amazon Location Service
- Integration options
- Demo

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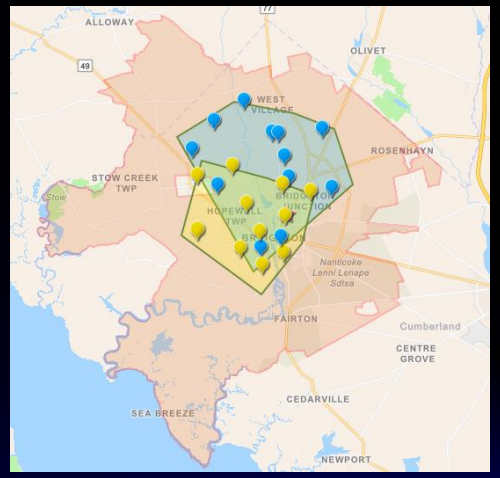
What is geospatial enrichment

Identify geospatial facts about non-geographic datasets

- Location of an address
- Demographic attributes
- Drive time/distance
- and more

customer_id	address_line	municipality_name	post_code
42	37 BRCA WA	FA R LAW	4
6	73 R UT R R	EAST BR RSWICK	5
2	955 R 27	E S R	8
23	RT	CRE R R LL	8 2
285	925 RWY 5	R D E W	4
295	8 5 R L ERAV	T EN OR	8
C	63 R RU SWCKAV	FERT AM Y	85
2	259 S BLACK RDGE P RE	R UR E REA R	8 59

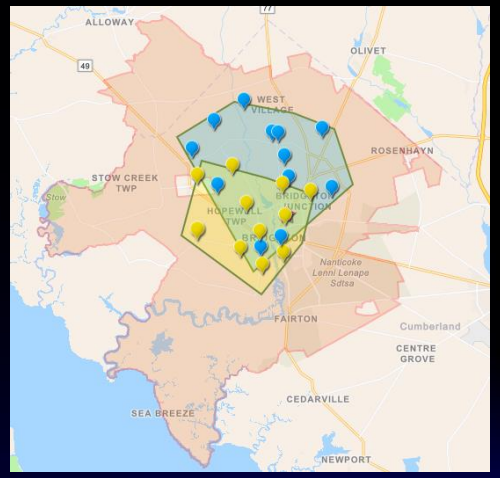




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Advantages of geospatial enrichment

- Advanced queries leveraging location attributes
- Location-based analytics
- Map visualization



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Geospatial objects and operations

Objects

- Coordinates (points)
- Distance (lines)
- Boundaries (polygons)
- Spatially inherited attributes

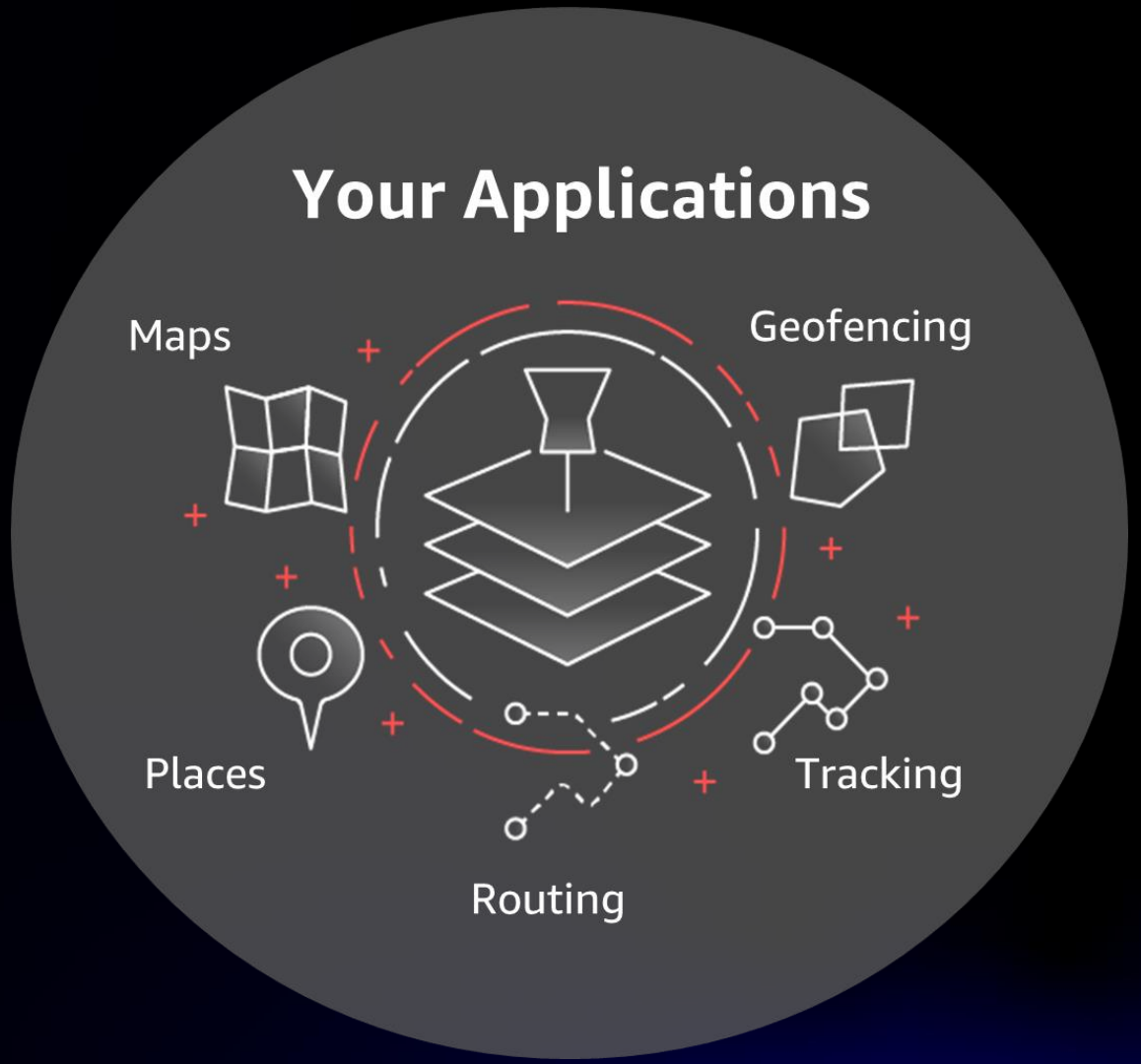
Operations

- Buffer
- Union/intersect
- Network analysis
- and more

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Amazon Location Service

- Shorter time to production
- Easy access to high-quality data
- Privacy and security
- Cost-effective



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Cloud-native solutions using Amazon Location

- Integrated with AWS so you can innovate faster and move to production more easily

Mobile, web, backend, and CloudFormation	 AWS Amplify  AWS Tools and SDKs  AWS CloudFormation
Monitoring, security, and compliance	 Amazon CloudWatch  AWS IAM  AWS CloudTrail
Service integration via Amazon EventBridge	 Amazon EventBridge  AWS Lambda  Amazon Kinesis  Amazon Simple Notification Service  Amazon Pinpoint ...  AWS Step Functions

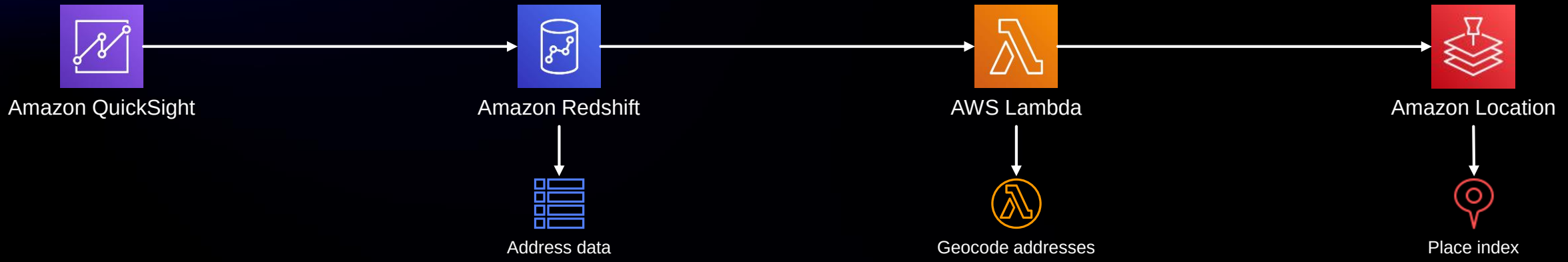
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Enriching data using Amazon Location

- AWS Lambda User Defined Function (UDF)
  - Amazon Redshift
  - Amazon RDS/Aurora (PostgreSQL & MySQL)
  - Amazon Athena
- Amazon S3 Object Lambda

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Integrate Amazon Redshift with Amazon Location




```
CREATE OR REPLACE EXTERNAL FUNCTION public.f_geocode_address(VARCHAR, VARCHAR,
                                                             VARCHAR, VARCHAR,
                                                             VARCHAR)
RETURNS VARCHAR
STABLE
LAMBDA 'GeocodeAddresses'
IAM_ROLE 'arn:aws:iam::<AccountId>:role/Redshift-Lambda-role';
```

User-defined function

```
SELECT f_geocode_address(address_line, municipality_name,
                         state_code, post_code, country_code)
       AS geocode_result
FROM customer_address
```

SQL command

```
{
   "arguments":[
      [
         "410 TERRY AVE N",
         "SEATTLE",
         "WA",
         "98109",
         "USA"
      ],
      [
         "510 W GEORGIA ST",
         "VANCOUVER",
         "BC",
         "V6B0M3",
         "CAN"
      ]
   ],
   "num_records":2
}
```

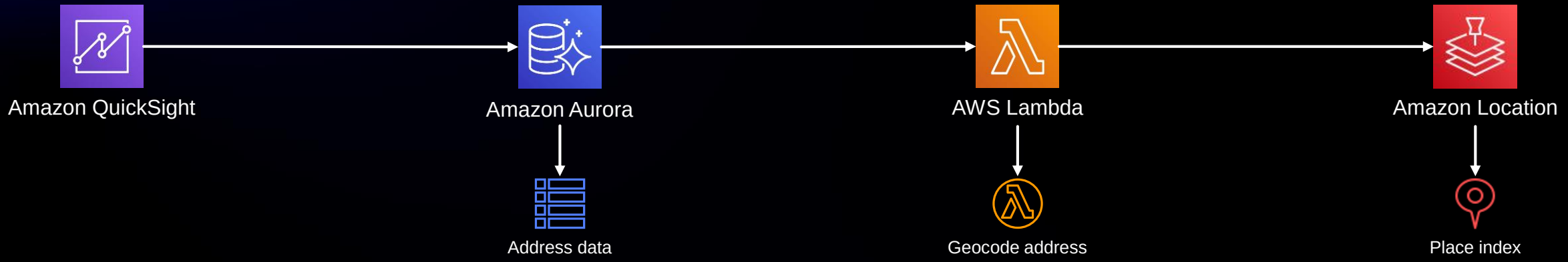
Request

```
{
   "success":true,
   "results":[
      {
         "Longitude":-122.33664798659117,
         "Latitude":47.62231899780329,
         "Label":"410 Terry Ave N, Seattle, WA, 98109, USA"
      },
      {
         "Longitude":-123.11693997267491,
         "Latitude":49.281259993687854,
         "Label":"510 W Georgia St, Vancouver, British Columbia, V6B 0M3, CAN"
      }
   ]
}
```

Response

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Integrate Amazon RDS with Amazon Location




```
CREATE OR REPLACE FUNCTION f_geocode_address(p_address_line varchar(85),
                                             p_municipality_name varchar(60),
                                             p_state_code varchar(2),
                                             p_post_code varchar(10),
                                             p_country_code varchar(3))
...
```

User-defined function

```
UPDATE customer_address
SET geocode_result = f_geocode_address(address_line, municipality_name,
                                       state_code, post_code, country_code)::json
```

SQL command

```
{
   "address_line": "410 TERRY AVE N",
   "municipality_name": "SEATTLE",
   "state_code": "WA",
   "post_code": "98109",
   "country_code": "USA"
}
```

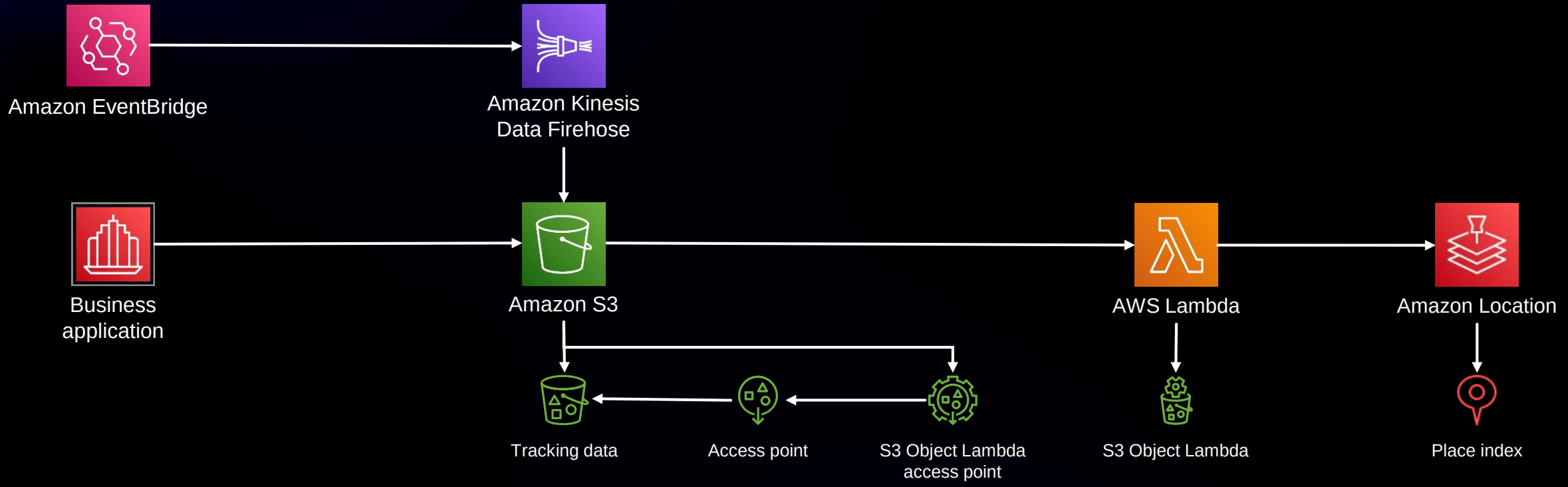
Request

```
{
   "Longitude":-122.33664798659117,
   "Latitude":47.62231899780329,
   "Label":"410 Terry Ave N, Seattle, WA, 98109, USA"
}
```

Response

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Integrate Amazon S3 with Amazon Location




```
{
    "DeviceId": "8e76bb04-f79f-4a14",
    "DateTime": "2021-10-05T13:40:28Z",
    "Longitude": -122.33674597103928,
    "Latitude": 47.62230001279261
}
```

Original object

```
{
    "DeviceId": "8e76bb04-f79f-4a14",
    "DateTime": "2021-10-05T13:40:28Z",
    "Longitude": -122.33674597103928,
    "Latitude": 47.62230001279261
    "Municipality": "Seattle",
    "State": "Washington",
    "PostalCode": "98109",
    "Country": "USA"
}
```

Enriched object

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Resources

- Amazon Location Service
- Amazon Redshift Lambda UDF
- Amazon RDS PostgreSQL Lambda UDF
- Amazon Athena Lambda UDF
- Amazon S3 Object Lambda
- Blog: Access Amazon Location Service from Amazon Redshift
- Blog: Access Amazon Location Service from Amazon RDS
- GitHub: Amazon Location Athena UDF

Scan QR code to access links to these resources

aws

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Thank you!

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