

AWS
re:Invent

TLC204-R

Implementing telecommunication data analytics

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Prerequisites

Prerequisites

Internet connectivity

- Download raw data record for the lab

<https://builder2019.s3.amazonaws.com/rawdata.csv>

AWS account

- Amazon S3 access
- AWS Glue access
- Amazon Athena access
- Amazon QuickSight access

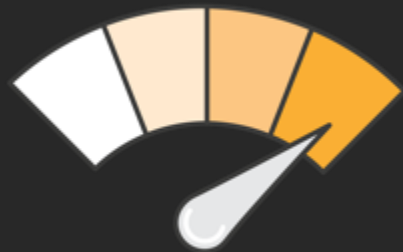
AWS data analytics for telco

AWS can help **solve** data analytics for telco professionals

1



2



3



Data analytics made accessible

Deployed quickly with tools for staff at all levels of data science capability

Simplified pre-processing and ETL, freeing time and resources for experimentation

Reduced time and costs of data analytics with AWS services

Meaningful data analytics

Operations

Sales

Data analytics with AWS Glue and Athena



1. Setup a crawler to run periodically, scan your data, and automatically populate the Glue Data Catalog

2. Once your data in the Glue Data Catalog, it is readily available for querying in Amazon Athena and Amazon Redshift Spectrum – no additional steps required!

Telco-specific data: Event data record (EDR)

EDR provides a range of information related to subscriber detailed information, which is useful for carriers



Gain valuable insights!



Information example

“NMS, OSS, CS”

Network performance data

Network Management System (NMS): provides raw data related to network performance

Network health status

Operation Support System (OSS): provides raw data related to network health status

Subscriber behavior

Charging System (CS): provides raw data related to subscriber specific behavior

EDR



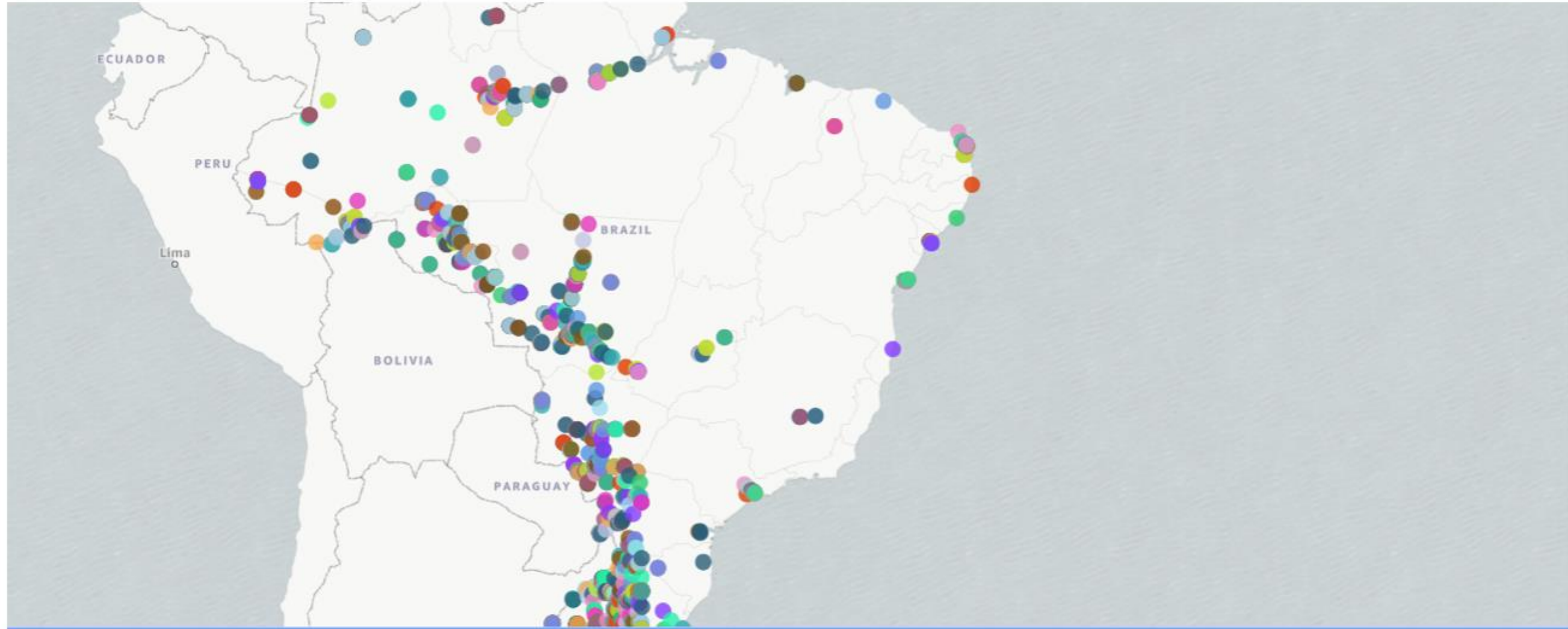
Gain value from EDR: Download rate per city (example)

Count of Records by Location_latitude, Location_longitude, and Download_rate(bps)

SHOWING TOP 5000 IN LOCATION_LATITUDE, LOCATION_LONGITUDE AND TOP 4697 IN DOWNLOAD_RATE(BPS)



Minimize

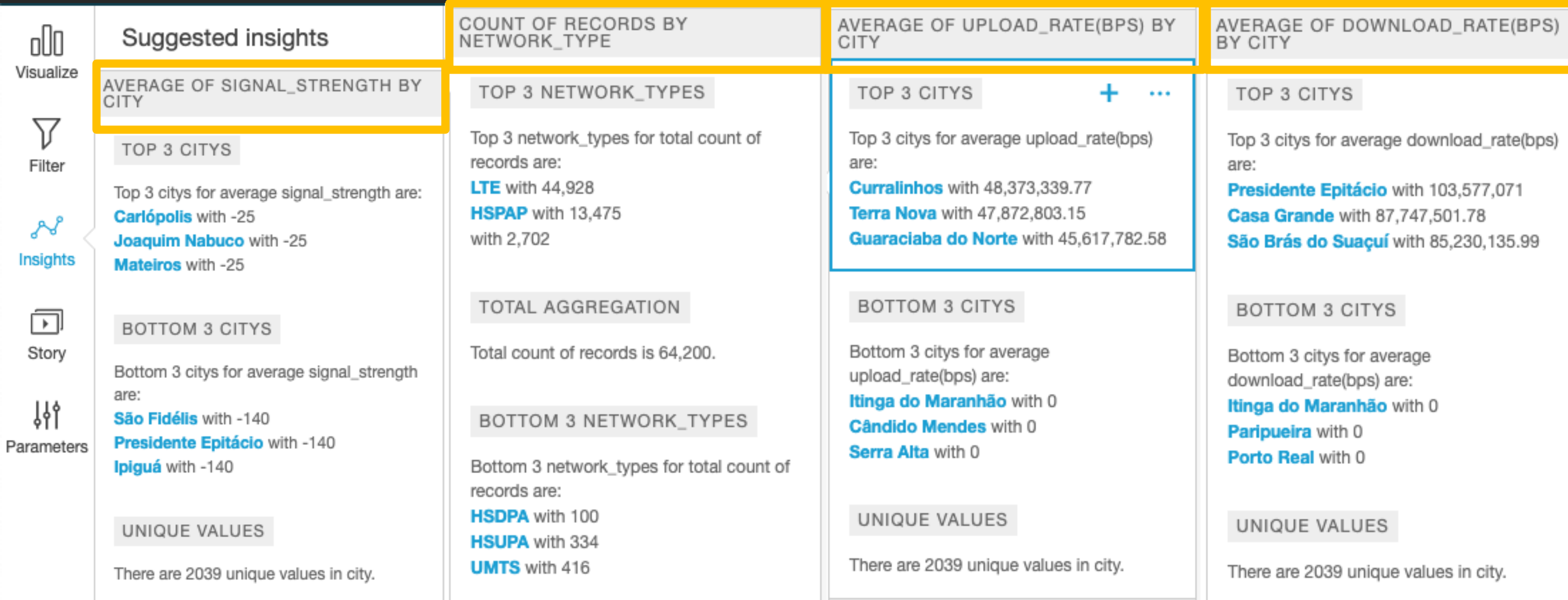


Download_r...

- 13,527,083...
- 13,541,945...
- 13,548,481...
- 13,554,252...
- 13,555,618...
- 13,557,921...
- 13,566,137
- 13,568,145...
- 13,590,630...
- 13,599,771...
- 13,610,357...
- 13,643,093...
- 13,651,059...
- 13,655,839...
- 13,667,921
- 13,708,599...
- 13,722,419...
- 13,732,547...
- 13,746,462...
- 13,748,267...
- 13,761,507...
- 13,793,631...
- 13,811,634.8
- 13,812,821...
- 13,831,694...



Gain value from EDR: Quick insights into your network



Build time!

How to get these insights?

Time for a hands-on lab!

Requirements:

- Amazon S3 access
- AWS Glue access
- Athena access
- Amazon QuickSight access

Amazon S3: Uploading your EDR

Amazon S3: Store EDR file

The screenshot shows the Amazon S3 Management Console interface. The browser address bar displays the URL: `https://s3.console.aws.amazon.com/s3/buckets/builder2019?region=us-east-1&tab=overview`. The page title is "Amazon S3 > builder2019". The navigation tabs include "Overview", "Properties", "Permissions", and "Management". A search bar is present with the placeholder text "Type a prefix and press Enter to search. Press ESC to clear." Below the search bar are buttons for "Upload", "Create folder", "Download", and "Actions". The region is set to "US East (N. Virginia)".

The main content area shows a table of objects. The table has columns for "Name", "Last modified", "Size", and "Storage class". There is one object listed:

Name	Last modified	Size	Storage class
Call Data Record - Dummy_v3_SP.csv	Jun 1, 2019 1:27:28 PM GMT-0500	23.1 MB	Standard

At the bottom of the console, there is a status bar showing "Operations: 0 In progress, 1 Success, 0 Error". The footer includes "Feedback", "English (US)", and copyright information: "© 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use".

AWS Glue crawler for your EDR

AWS Glue: Create data crawler

The screenshot shows the AWS Glue console interface in a Chrome browser. The page title is "Add crawler" and the main heading is "Add information about your crawler". On the left, a sidebar lists the steps: "Crawler info" (selected), "Crawler source type", "Data store", "IAM Role", "Schedule", "Output", and "Review all steps". The main content area shows a form for "Crawler name" with the value "cdr_crawler_builder2019" entered. Below the form, there is a link for "Tags, description, security configuration, and classifiers (optional)". A blue "Next" button is positioned at the bottom right of the form area. The browser's address bar shows the URL "https://us-east-1.console.aws.amazon.com/glue/home?region=us-east-1#addCrawler:". The footer contains "Feedback", "English (US)", and copyright information for Amazon Web Services, Inc. (© 2008 - 2019).

Chrome File Edit View History Bookmarks People Window Help

AWS Glue Console

https://us-east-1.console.aws.amazon.com/glue/home?region=us-east-1#addCrawler:

aws Services Resource Groups

sigitp@amazon.com @ sigitp N. Virginia Support

Add crawler

Add information about your crawler

Crawler name

cdr_crawler_builder2019

▸ Tags, description, security configuration, and classifiers (optional)

Next

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AWS Glue: Create data crawler

The screenshot shows the AWS Glue console interface for creating a new crawler. The browser address bar indicates the URL: `https://us-east-1.console.aws.amazon.com/glue/home?region=us-east-1#addCrawler:`. The page title is "Add crawler".

On the left side, there is a navigation pane with the following steps:

- Crawler info**
 - cdr_crawler_builder2019
- Crawler source type**
 - Data stores
- Data store**
 - S3: s3://builder2019
- IAM Role**
 - arn:aws:iam::989480987093:role/service-role/AWSGlueServiceRole-S3-Crawler
- Schedule**
- Output**
- Review all steps**

The main content area is titled "Create a schedule for this crawler". A dropdown menu labeled "Frequency" is open, showing the following options:

- Run on demand (selected)
- Run on demand
- Hourly
- Daily
- Choose days
- Weekly
- Monthly

At the bottom of the page, there is a footer with "Feedback", "English (US)", and copyright information: "© 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use".

AWS Glue: Create data crawler

The screenshot shows the AWS Glue console interface. The breadcrumb navigation indicates the crawler 'cdr_crawler_builder2019'. Two buttons, 'Run crawler' and 'Edit', are visible. The configuration details are as follows:

Name	cdr_crawler_builder2019
Description	
Create a single schema for each S3 path	false
Security configuration	
Tags	-
State	Ready
Schedule	
Last updated	Sat Jun 01 13:31:31 GMT-500 2019
Date created	Sat Jun 01 13:31:31 GMT-500 2019
Database	cdr_db_builder2019
Service role	service-role/AWSGlueServiceRole-S3-Crawler
Selected classifiers	
Data store	S3
Include path	s3://builder2019
Exclude patterns	
Configuration options	
Schema updates in the data store	Update the table definition in the data catalog.
Object deletion in the data store	Mark the table as deprecated in the data catalog.

AWS Glue: Create data crawler

The screenshot shows the AWS Glue console interface. The left sidebar contains navigation options: Data catalog, Databases, Tables, Connections, Crawlers (selected), Classifiers, Settings, ETL, Jobs, Triggers, Dev endpoints, Notebooks, Security, Security configurations, and Tutorials. The main content area is titled 'Crawlers' and includes a description: 'A crawler connects to a data store, progresses through a prioritized list of classifiers to determine the schema for your data, and then creates metadata tables in your data catalog.' Below this is a 'User preferences' link and a search bar. A table lists the crawler details:

<input type="checkbox"/>	Name	Schedule	Status	Logs	Last runtime	Median runtime	Tables updated	Tables added
<input type="checkbox"/>	cdr_crawler_builde...		Ready	Logs	1 min	1 min	0	1

At the bottom of the console, there is a footer with 'Feedback', 'English (US)', and copyright information: '© 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use'.

AWS Glue: Database created by crawler

The screenshot shows the AWS Glue console interface. The browser address bar indicates the URL: `https://us-east-1.console.aws.amazon.com/glue/home?region=us-east-1#catalog:tab=databases`. The left-hand navigation pane lists various AWS Glue components, with 'Databases' selected. The main content area displays the 'Databases' page, which includes a description: 'A database is a set of associated table definitions, organized into a logical group.' Below this, there are buttons for 'Add database', 'View tables', and 'Action'. A table lists the existing databases, with one entry: 'cdr_db_builder2019'. The bottom of the page features a footer with 'Feedback', 'English (US)', and copyright information for Amazon Web Services, Inc. (© 2008 - 2019).

AWS Glue

Data catalog

- Databases**
- Tables
- Connections
- Crawlers
- Classifiers
- Settings

ETL

- Jobs
- Triggers
- Dev endpoints
- Notebooks

Security

- Security configurations

Tutorials

- Add crawler

Databases A database is a set of associated table definitions, organized into a logical group.

[Add database](#) [View tables](#) [Action](#)

Showing: 1 - 1

Name	Description
cdr_db_builder2019	

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AWS Glue: Table inside the database

The screenshot shows the AWS Glue console interface. The left sidebar contains navigation options: Data catalog, Databases, Tables (selected), Connections, Crawlers, Classifiers, Settings, ETL, Jobs, Triggers, Dev endpoints, Notebooks, Security, Security configurations, Tutorials, and Add crawler. The main content area is titled 'Tables' and includes a description: 'A table is the metadata definition that represents your data, including its schema. A table can be used as a source or target in a job definition.' Below this is a search bar with 'Database : cdr_db_builder2019' and a 'Filter or search for tables...' input. A table lists the following data:

<input type="checkbox"/>	Name	Database	Location	Classification	Last updated	Deprecated
<input type="checkbox"/>	builder2019	cdr_db_builder2019	s3://builder2019/	csv	1 June 2019 1:32 PM ...	

The footer of the console shows 'Feedback', 'English (US)', and copyright information: '© 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy Terms of Use'.

AWS Glue: Table inside the database

The screenshot shows the AWS Glue console interface. The browser address bar indicates the URL: `https://us-east-1.console.aws.amazon.com/glue/home?region=us-east-1#table:name=builder2019;namespace=cdr_db_builder...`. The console header shows the user is logged in as `sigitp@amazon.com` in the `N. Virginia` region. The left sidebar contains navigation options for AWS Glue, including Data catalog, Databases, Tables, Connections, Crawlers, Classifiers, Settings, ETL, Jobs, Triggers, Dev endpoints, Notebooks, Security, Security configurations, and Tutorials. The main content area displays the details for the table `builder2019` in the `cdr_db_builder2019` database. The table was last updated on `Sat Jun 01 13:32:47 GMT-500 2019`. The Serde parameters are `field.delim ,`. The Table properties include `skip.header.line.count 1`, `sizeKey 24250706`, `objectCount 1`, `UPDATED_BY_CRAWLER cdr_crawler_builder2019`, `CrawlerSchemaSerializerVersion 1.0`, `recordCount 46725`, `averageRecordSize 519`, `CrawlerSchemaDeserializerVersion 1.0`, `compressionType none`, `columnsOrdered true`, `areColumnsQuoted false`, `delimiter ,`, and `typeOfData file`. Buttons for `Edit table`, `Delete table`, `View properties`, `Compare versions`, and `Edit schema` are visible.

AWS Glue

Tables > builder2019

Last updated 1 Jun 2019 Table Version (Current version) ▾

[Edit table](#) [Delete table](#) [View properties](#) [Compare versions](#) [Edit schema](#)

Name builder2019

Description

Database cdr_db_builder2019

Classification csv

Location [s3://builder2019/](#)

Connection

Deprecated No

Last updated Sat Jun 01 13:32:47 GMT-500 2019

Input format org.apache.hadoop.mapred.TextInputFormat

Output format org.apache.hadoop.hive ql.io.HiveIgnoreKeyTextOutputFormat

Serde serialization lib org.apache.hadoop.hive.serde2.lazy.LazySimpleSerDe

Serde parameters field.delim ,

Table properties

skip.header.line.count 1 sizeKey 24250706 objectCount 1 UPDATED_BY_CRAWLER cdr_crawler_builder2019

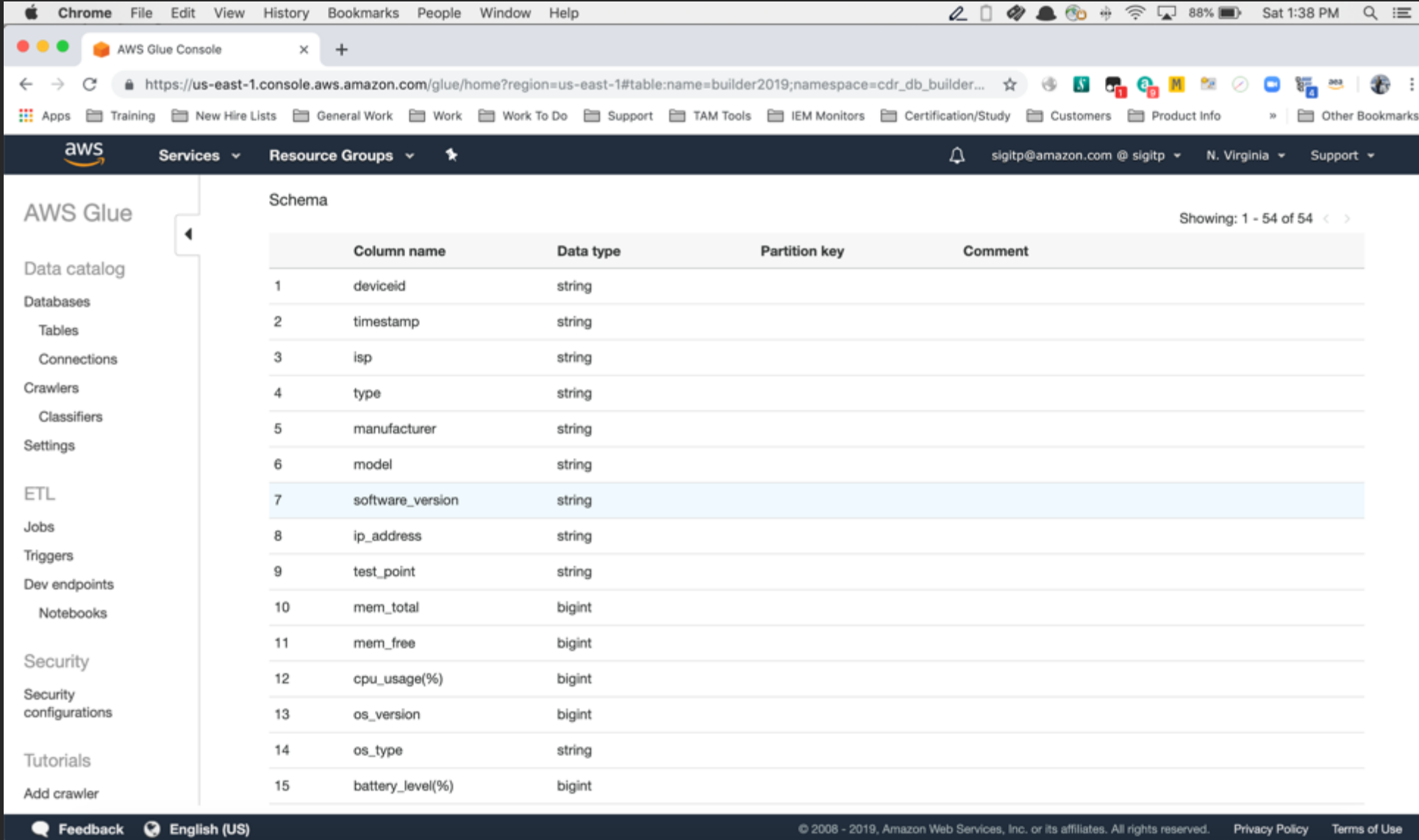
CrawlerSchemaSerializerVersion 1.0 recordCount 46725 averageRecordSize 519

CrawlerSchemaDeserializerVersion 1.0 compressionType none columnsOrdered true areColumnsQuoted false

delimiter , typeOfData file

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AWS Glue: Columns and types automatically crawled



The screenshot shows the AWS Glue console interface. The left sidebar contains navigation options: AWS Glue, Data catalog, Databases, Tables, Connections, Crawlers, Classifiers, Settings, ETL, Jobs, Triggers, Dev endpoints, Notebooks, Security, Security configurations, Tutorials, and Add crawler. The main content area displays a 'Schema' table with the following columns: Column name, Data type, Partition key, and Comment. The table lists 15 columns, with the 7th column, 'software_version', highlighted in blue. The table is paginated, showing 1-54 of 54 items.

	Column name	Data type	Partition key	Comment
1	deviceid	string		
2	timestamp	string		
3	isp	string		
4	type	string		
5	manufacturer	string		
6	model	string		
7	software_version	string		
8	ip_address	string		
9	test_point	string		
10	mem_total	bigint		
11	mem_free	bigint		
12	cpu_usage(%)	bigint		
13	os_version	bigint		
14	os_type	string		
15	battery_level(%)	bigint		

Showing: 1 - 54 of 54 < >

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AWS Glue: Correcting data type

AWS Glue: Edit schema

The screenshot shows the AWS Glue console interface for editing a table schema. The browser window displays the URL: `https://us-east-1.console.aws.amazon.com/glue/home?region=us-east-1#table:name=builder2019;namespace=cdr_db_builder...`. The page title is "Tables > builder2019".

Table Details:

- Name:** builder2019
- Description:**
- Database:** cdr_db_builder2019
- Classification:** csv
- Location:** [s3://builder2019/](#)
- Connection:**
- Deprecated:** No
- Last updated:** Sat Jun 01 14:27:03 GMT-500 2019
- Input format:** org.apache.hadoop.mapred.TextInputFormat
- Output format:** org.apache.hadoop.hive ql.io.HiveIgnoreKeyTextOutputFormat
- Serde serialization lib:** org.apache.hadoop.hive.serde2.lazy.LazySimpleSerDe

Serde parameters:

- field.delim: ,

Table properties:

- skip.header.line.count: 1
- sizeKey: 23966415
- objectCount: 1
- UPDATED_BY_CRAWLER: cdr_crawler_builder2019
- CrawlerSchemaSerializerVersion: 1.0
- recordCount: 46446
- averageRecordSize: 516
- CrawlerSchemaDeserializerVersion: 1.0
- compressionType: none
- columnsOrdered: true
- areColumnsQuoted: false
- delimiter: ,
- typeOfData: file

Actions: Edit table, Delete table, View properties, Compare versions, Edit schema.

Footer: Feedback, English (US), © 2008 - 2019, Amazon Web Services, Inc. or its affiliates. All rights reserved. Privacy Policy, Terms of Use.

AWS Glue: Download rate (string)

The screenshot shows the AWS Glue console interface. The main content area is titled 'Edit schema' for the table 'builder2019'. A table lists the schema columns:

Column name	Data type	Key	Comment
24 signal_strength	bigint		
25 roaming	bigint		
26 wan_mode	string		
27 network_type_changed	bigint		
28 download_state	string		
29 download_filesize_test(bytes)	bigint		
30 download_rate(bps)	string		
31 upload_state	string		
32 upload_filesize_test(bytes)	bigint		
33 upload_rate(bps)	double		
34 udp_state	string		
35 udp_estimated_traffic(bytes)	bigint		

The 'download_rate(bps)' column is highlighted in blue. The interface includes a navigation sidebar on the left, a top navigation bar with the AWS logo, and a footer with 'Feedback', 'English (US)', and copyright information.

AWS Glue: Download rate fixing to double

The screenshot shows the AWS Glue console interface. A modal dialog titled "String type" is open, allowing the user to change the column type for the selected column. The dialog lists several data types: string, date, decimal, double, float, and int. The "double" option is currently selected. An "Update" button is visible at the bottom of the dialog.

The background shows the "builder2019" table with the following columns:

Column ID	Column name	Column type	Actions
24	signal_strength		
25	roaming		
26	wan_mode		
27	network_type_changed		
28	download_state		
29	download_filesize_test		
30	download_rate(bps)	string	✕
31	upload_state	string	✕
32	upload_filesize_test(bytes)	bigint	✕
33	upload_rate(bps)	double	✕
34	udp_state	string	✕
35	udp_estimated_traffic(bytes)	bigint	✕

Athena: Query your database

Athena: Query your database

The screenshot displays the AWS Athena Query Editor interface. The browser address bar shows the URL: `https://us-east-1.console.aws.amazon.com/athena/home?force=®ion=us-east-1#query/history/e6079621-0e04-488c-980...`. The interface includes a navigation bar with 'Athena', 'Query Editor', 'Saved Queries', 'History', 'AWS Glue Data Catalog', and 'Workgroup: primary'. On the left, the 'Database' section is set to 'cdr_db_builder2019', and a list of tables is shown, including 'builder2019' with various columns like 'deviceid', 'timestamp', 'isp', etc. The main query editor contains the SQL query: `SELECT * FROM "cdr_db_builder2019"."builder2019";`. Below the query, the 'Run query' button is highlighted, and the status indicates '(Run time: 3.63 seconds, Data scanned: 22.86 MB)'. The 'Results' section at the bottom displays a table with 11 columns and 9 rows of data.

	deviceid	timestamp	isp	type	manufacturer	model	software_version	ip_address	test_point	mem_total	mem_fre
1	0C5521-355667089427659	59:59.8	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn016	127.92.250.33	110.194.148.68	1913	336
2	0C5521-352645098019926	59:57.6	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	127.92.221.28	110.194.132.68	1884	562
3	0C5521-356707090721556	59:54.3	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	129.242.10.100	110.194.148.68	2879	415
4	0C5521-356565093648386	59:54.2	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	187.26.151.90	110.194.132.68	1404	569
5	0C5521-354211090276150	59:52.4	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	177.58.238.46	110.194.132.68	1867	668
6	0C5521-353110060392057	59:49.0	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	127.92.234.66	110.194.132.68	1705	436
7	0C5521-357719073218897	59:48.6	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	127.92.234.13	110.194.132.68	927	163
8	0C5521-352583082465104	59:46.5	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	127.95.4.81	110.194.132.68	2832	1184
9	0C5521-351888094411652	59:45.8	CellcoTel	smp	PhoneTech	Phone XXX	3.2.6phn019	129.242.29.34	110.194.132.68	902	256

Athena: Query your database

The screenshot displays the AWS Athena Query Editor interface. The browser's address bar shows the URL: `https://us-east-1.console.aws.amazon.com/athena/home?force=®ion=us-east-1#query`. The page header includes the AWS logo, navigation menus for Services, Resource Groups, and Workgroup: primary, and user information for sigitp@amazon.com in N. Virginia. The main content area is divided into two sections:

- Database:** A dropdown menu is set to `cdr_db_builder2019`. Below it is a search box for tables and views.
- Tables (1):** A list of tables with their data types, including `cell_id_changed (bigint)`, `lac (bigint)`, `tac (bigint)`, `cg/ve-cgi (string)`, `imei (string)`, `imsi (string)`, `network_type (string)`, `signal_strength (bigint)`, `roaming (bigint)`, `wan_mode (string)`, `network_type_changed (bigint)`, `download_state (string)`, `download_filesize_test(bytes) (bigint)`, `download_rate(bps) (double)`, `upload_state (string)`, `upload_filesize_test(bytes) (bigint)`, `upload_rate(bps) (double)`, `udp_state (string)`, `udp_estimated_traffic(bytes) (bigint)`, `udp_latency(ms) (double)`, `udp_jitter(ms) (double)`, and `udp_packet_loss_percent(%) (bigint)`.

The central query editor shows a new query with the following SQL code:

```
1 SELECT * FROM "cdr_db_builder2019"."builder2019";download_rate(bps), download_rate(bps),
```

Below the query editor are buttons for `Run query`, `Save as`, `Create`, `Format query`, and `Clear`. A note indicates: "Use Ctrl + Enter to run query, Ctrl + Space to autocomplete". The `Results` section is currently empty.

Amazon QuickSight: Visualize your insights!

Amazon QuickSight: Manage Amazon QuickSight

The screenshot shows the Amazon QuickSight console interface. The browser's address bar displays the URL `https://us-east-1.quicksight.aws.amazon.com/sn/start`. The main header includes the QuickSight logo, a search bar with the placeholder text "Search for analyses, data sets, and dashboards", and a user profile icon for "N. Virginia sigitp@...".

On the left side, there is a "New analysis" button. Below it, a navigation bar contains three tabs: "All analyses" (which is selected), "All dashboards", and "Tutorial videos".

The main content area displays the message "It's quiet in here." followed by the instruction "Contact your QuickSight Administrator or Authors to share analyses with you.".

A dropdown menu is open on the right side, listing the following options: "Manage QuickSight", "Community", "Send feedback", "What's new", "English" (with a globe icon and a right-pointing arrow), "Help", and "Sign out".

The browser's taskbar at the top shows several open tabs: "Athena", "AWS Glue Console", "S3 Management Console", and "Home". The system tray on the right indicates the date and time as "Sun 3:58 PM" and the battery level as "19%".

Amazon QuickSight: Manage AWS service permissions

The screenshot shows the Amazon QuickSight Admin console in a Chrome browser. The browser tabs include Athena, AWS Glue Console, S3 Management Console, and Admin. The address bar shows the URL: <https://us-east-1.quicksight.aws.amazon.com/sn/admin#permissions>. The page header displays the QuickSight logo and the account name: sigltp-quicksight, Edition: Enterprise. The left sidebar contains navigation links: Manage users, Your subscriptions, SPICE capacity, Account settings (highlighted), Manage VPC connections, and Domains and Embedding. The main content area is titled "Account settings" and includes the following sections:

- Notification email address:** A text input field containing "sigltp@amazon.com". Below it, a note states: "This will be where access requests and service notifications will be sent." A checkbox labeled "Enable IAM user access requests to this account." is checked.
- QuickSight access to AWS services:** A section with the text: "By configuring access to AWS services, QuickSight can access the data in those services. Access by users and groups can be controlled through the options below." Below this text is a button labeled "Add or remove".
- Close this QuickSight account:** A section with the text: "By unsubscribing you will be deleting all content related to this account including:" followed by a bulleted list:
 - Data sources
 - Data sets
 - Analyses
 - Published dashboardsBelow the list is a red button labeled "Unsubscribe".

Amazon QuickSight: Allow access to Athena and S3

QuickSight

Edit QuickSight read-only access to AWS resources

- Enable autodiscovery of data and users in your Amazon Redshift, Amazon RDS, and AWS IAM services.
- Amazon Athena
Enables QuickSight access to Amazon Athena databases

Please ensure the right Amazon S3 buckets are also enabled for QuickSight.
- Amazon S3 [Choose S3 buckets](#)
Enables QuickSight to auto-discover your Amazon S3 buckets
- Amazon S3 Storage Analytics
Enables QuickSight to visualize your S3 Storage Analytics data
- AWS IoT Analytics
Enables QuickSight to visualize your IoT Analytics data

Amazon QuickSight: S3 bucket access

The screenshot shows a web browser window with the Amazon QuickSight console. The browser's address bar displays the URL: `https://us-east-1.quicksight.aws.amazon.com/sn/console/resources?#`. The page title is "QuickSight". A modal dialog box titled "Select Amazon S3 buckets" is open in the center. The dialog has two tabs: "S3 buckets linked to QuickSight account" (which is active) and "S3 buckets you can access across AWS". Below the tabs, there is a heading "Select AWS S3 buckets to give QuickSight access permission to the bucket." and a "Select all" checkbox. A list of S3 buckets follows, each with a checkbox and a name:

- bigdatalab-sigitp
- builder2019
- cf-templates-39equam7h111-us-east-1
- cf-templates-39equam7h111-us-west-2
- config-bucket-989480987093
- do-not-delete-gatedgarden-audit-989480987093
- elasticbeanstalk-us-east-1-989480987093

At the bottom of the dialog, there are two buttons: "Close" and "Select buckets".

Amazon QuickSight: Update permissions

The screenshot shows the Amazon QuickSight console interface. At the top, the browser's address bar displays the URL `https://us-east-1.quicksight.aws.amazon.com/sn/console/resources`. The page title is "Edit QuickSight read-only access to AWS resources".

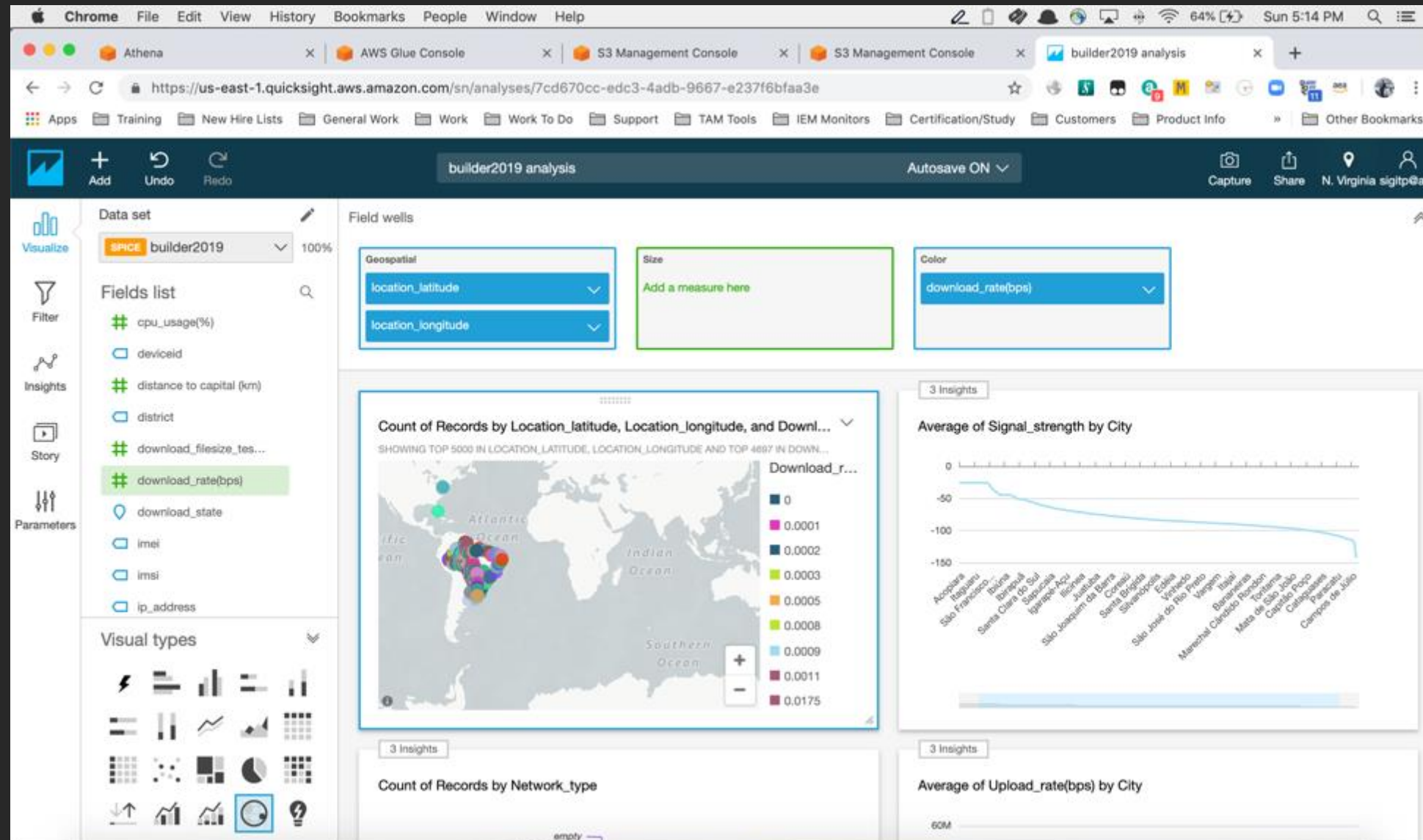
The main content area contains a list of services with checkboxes for enabling access:

- Enable autodiscovery of data and users in your Amazon Redshift, Amazon RDS, and AWS IAM services.
- Amazon Athena
Enables QuickSight access to Amazon Athena databases
- Amazon S3 (1 buckets selected) [Choose S3 buckets](#)
Enables QuickSight to auto-discover your Amazon S3 buckets
- Amazon S3 Storage Analytics
Enables QuickSight to visualize your S3 Storage Analytics data
- AWS IoT Analytics
Enables QuickSight to visualize your IoT Analytics data

A light blue warning box is present, stating: "Please ensure the right Amazon S3 buckets are also enabled for QuickSight."

At the bottom of the page, there are two buttons: "Cancel" and "Update".

Amazon QuickSight: Start to explore your visuals!

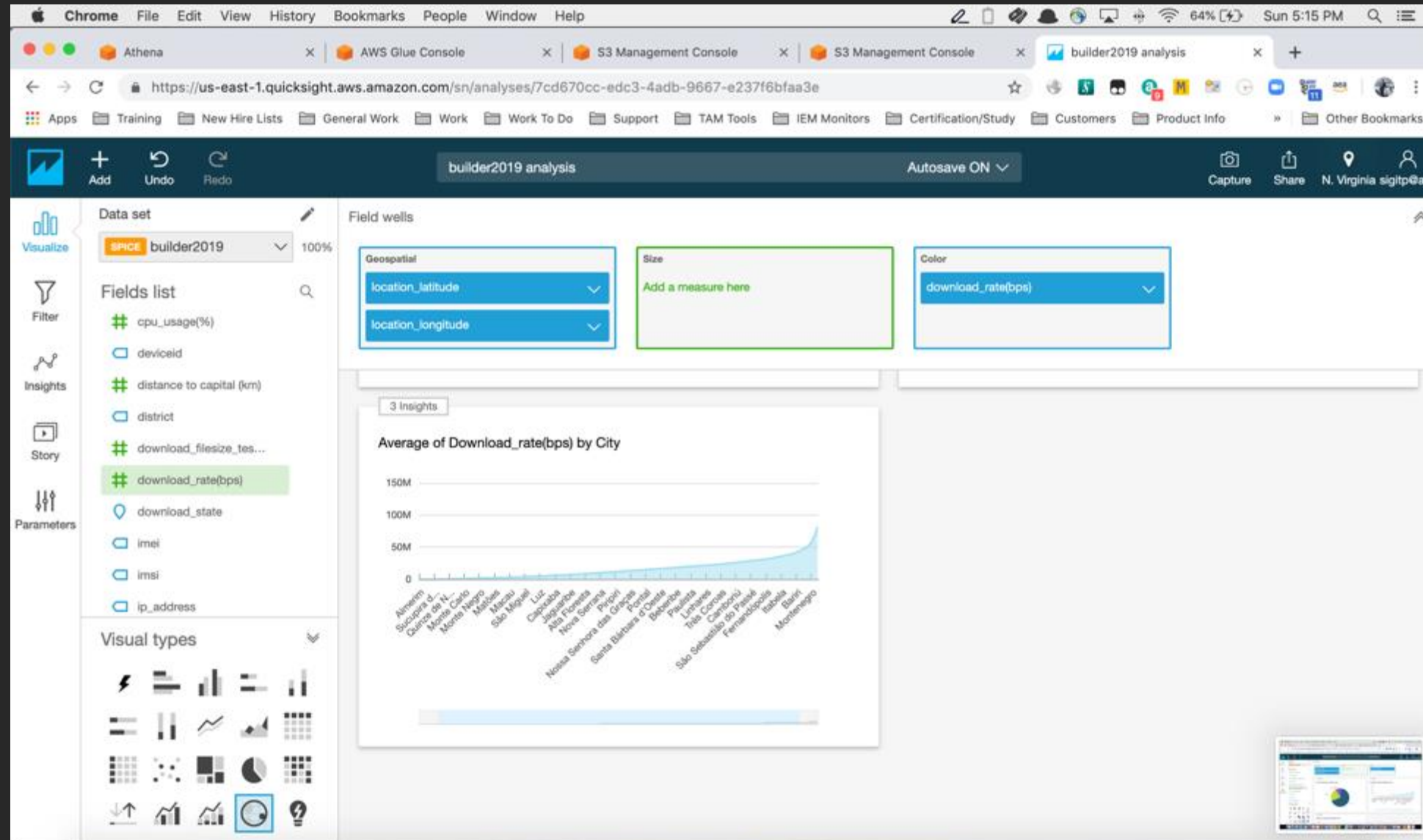


Amazon QuickSight: Start to explore your visuals!

The screenshot displays the Amazon QuickSight interface for a dashboard named "builder2019 analysis". The browser tabs include Athena, AWS Glue Console, and S3 Management Console. The URL is <https://us-east-1.quicksight.aws.amazon.com/sn/analyses/7cd670cc-edc3-4adb-9667-e237f6bfaa3e>. The interface features a left sidebar with navigation options: Visualize, Filter, Insights, Story, and Parameters. The main area is divided into several sections:

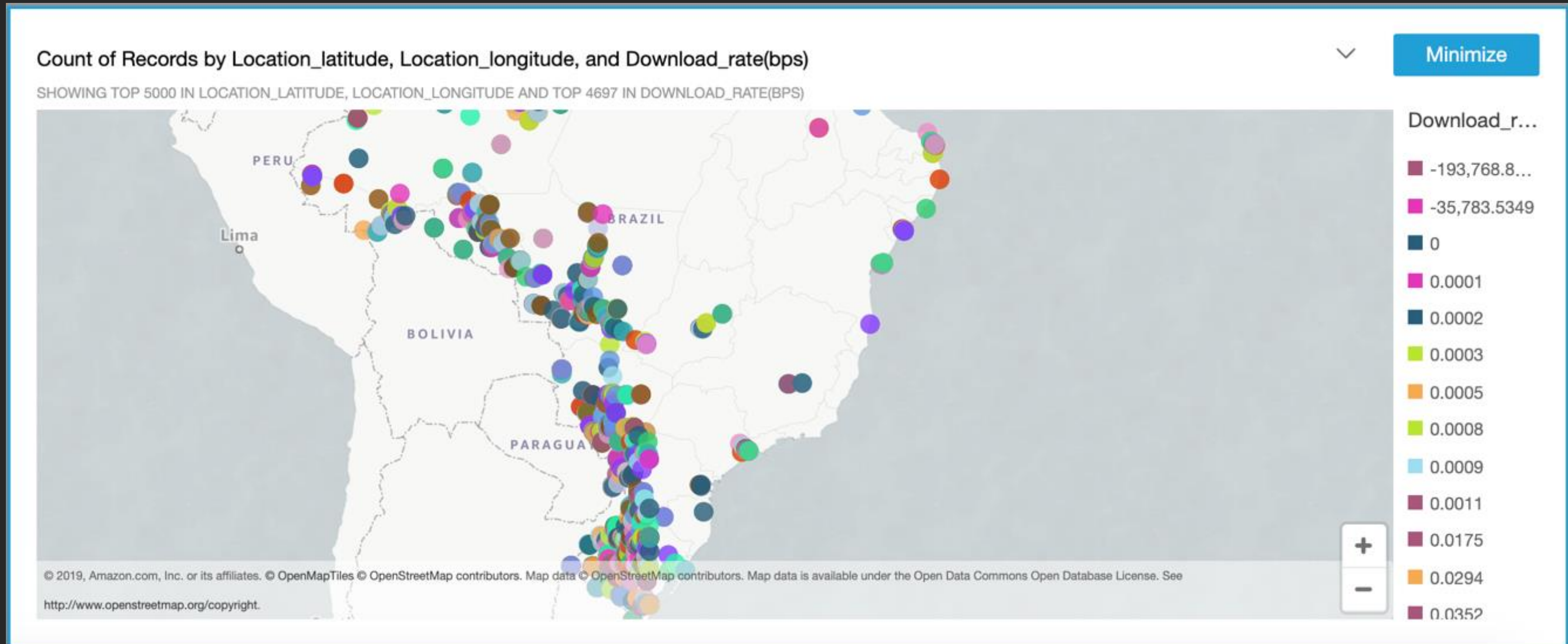
- Data set:** "builder2019" (100% zoom).
- Fields list:** A list of fields including `cpu_usage(%)`, `deviceid`, `distance to capital (km)`, `district`, `download_filesize_tes...`, `download_rate(bps)` (highlighted), `download_state`, `imei`, `imsi`, and `ip_address`.
- Visual types:** A grid of icons for different chart types, with a pie chart icon selected.
- Field wells:** Three wells are visible: "Geospatial" containing `location_latitude` and `location_longitude`; "Size" with a placeholder "Add a measure here"; and "Color" containing `download_rate(bps)`.
- Visuals:** Three charts are displayed:
 - Count of Records by Network_type:** A pie chart showing the distribution of records across network types: LTE (largest), HSPA, HSPAP, and empty.
 - Average of Upload_rate(bps) by City:** A line chart showing upload rates across various cities, with a significant increase for Rio Branco do Sul.
 - Average of Download_rate(bps) by City:** A line chart showing download rates across various cities, with a peak for Rio Branco do Sul.

Amazon QuickSight: Start to explore your visuals!

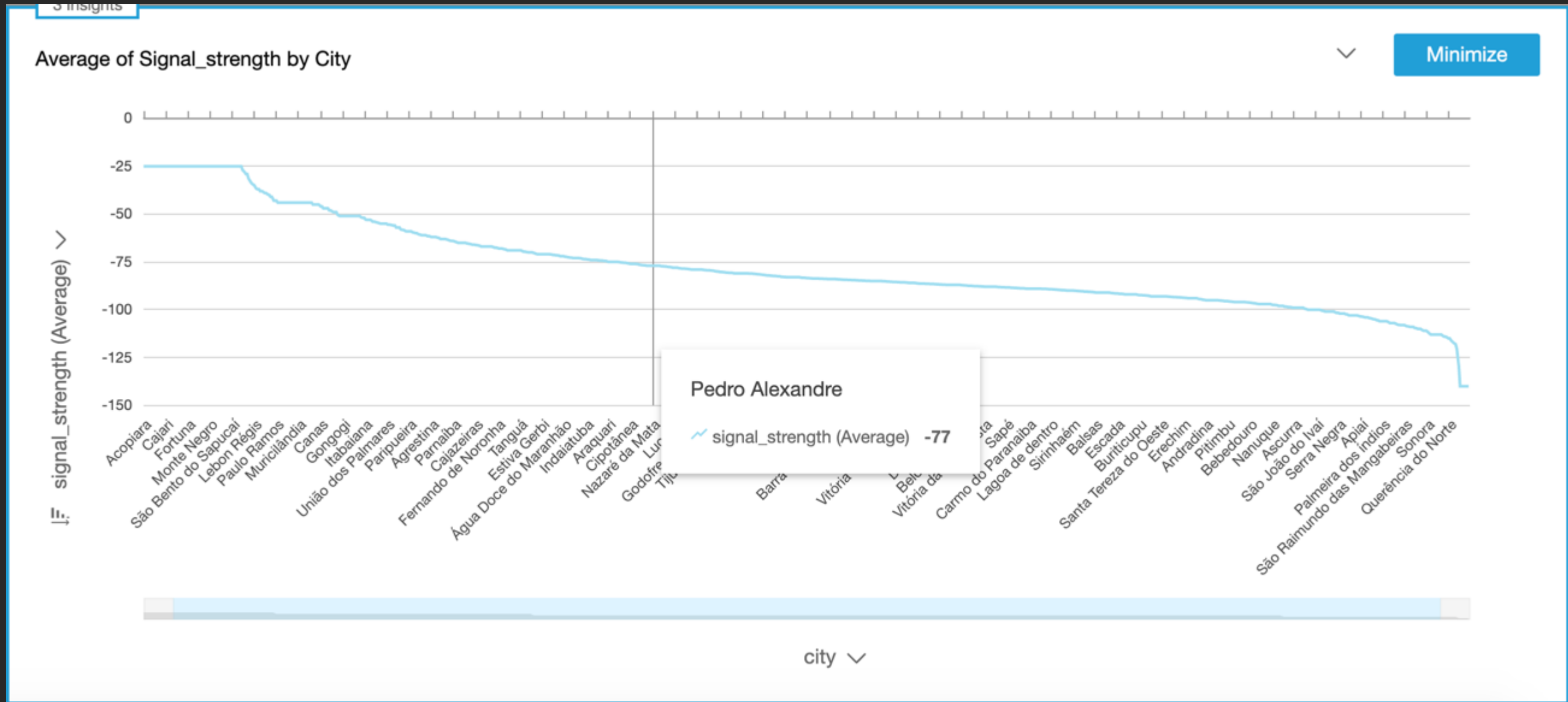


Amazon QuickSight reports

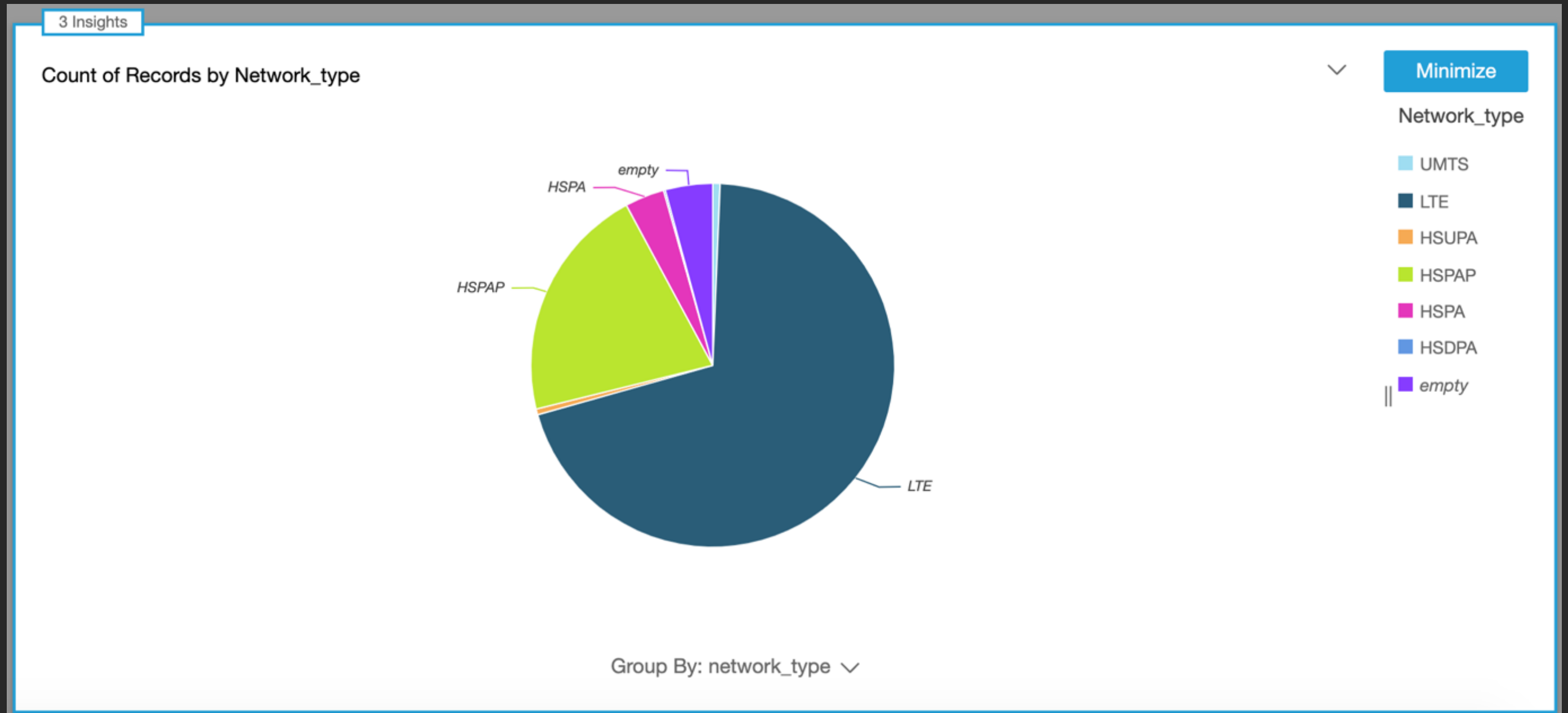
Amazon QuickSight report: DL rate mapped to location



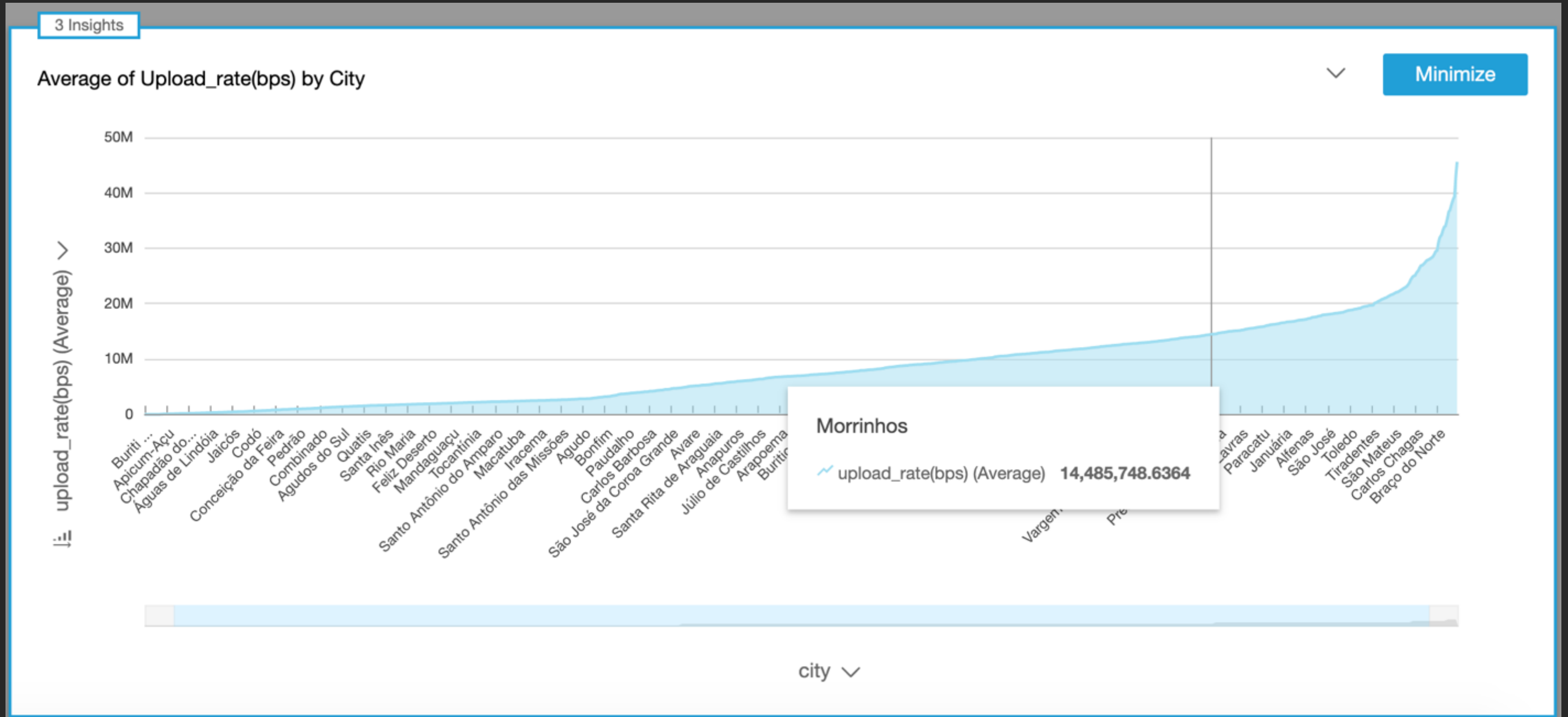
Amazon QuickSight report: Signal strength by city



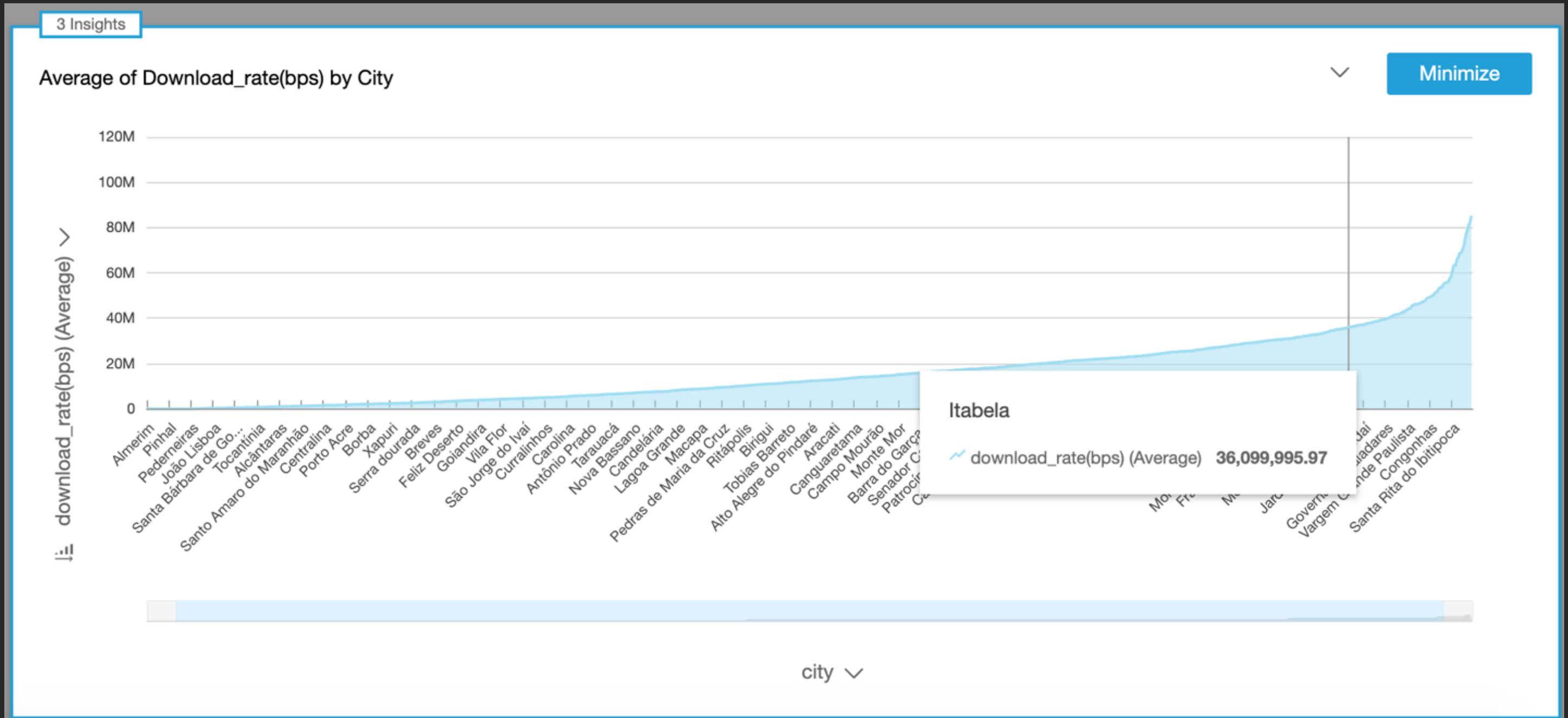
Amazon QuickSight report: Users access type, 3G, 4G, LTE



Amazon QuickSight report: Upload rate by city



Amazon QuickSight report: Download rate by city



Insights: Automated suggestion by Amazon QuickSight

Visualize

Filter

Insights

Story

Parameters

Suggested insights

AVERAGE OF SIGNAL_STRENGTH BY CITY

TOP 3 CITIES

Top 3 cities for average signal_strength are:
Carlópolis with -25
Joaquim Nabuco with -25
Mateiros with -25

BOTTOM 3 CITIES

Bottom 3 cities for average signal_strength are:
São Fidélis with -140
Presidente Epitácio with -140
Ipiguá with -140

UNIQUE VALUES

There are 2039 unique values in city.

COUNT OF RECORDS BY NETWORK_TYPE

TOP 3 NETWORK_TYPES

Top 3 network_types for total count of records are:
LTE with 44,928
HSPAP with 13,475
with 2,702

TOTAL AGGREGATION

Total count of records is 64,200.

BOTTOM 3 NETWORK_TYPES

Bottom 3 network_types for total count of records are:
HSDPA with 100
HSUPA with 334
UMTS with 416

AVERAGE OF UPLOAD_RATE(BPS) BY CITY

TOP 3 CITIES + ...

Top 3 cities for average upload_rate(bps) are:
Curralinhos with 48,373,339.77
Terra Nova with 47,872,803.15
Guaraciaba do Norte with 45,617,782.58

BOTTOM 3 CITIES

Bottom 3 cities for average upload_rate(bps) are:
Itinga do Maranhão with 0
Cândido Mendes with 0
Serra Alta with 0

UNIQUE VALUES

There are 2039 unique values in city.

AVERAGE OF DOWNLOAD_RATE(BPS) BY CITY

TOP 3 CITIES

Top 3 cities for average download_rate(bps) are:
Presidente Epitácio with 103,577,071
Casa Grande with 87,747,501.78
São Brás do Suaçuí with 85,230,135.99

BOTTOM 3 CITIES

Bottom 3 cities for average download_rate(bps) are:
Itinga do Maranhão with 0
Paripueira with 0
Porto Real with 0

UNIQUE VALUES

There are 2039 unique values in city.

Please join us
for a meet and greet!

Telecom Lounge

MGM | Level 3 | Pre-Function Foyer



Thank you!

Sigit Priyanggoro

sigitp@amazon.com



Please complete the session survey in the mobile app.