

AWS RE:INVENT

RE:CAP



AWS re:Invent re: Cap

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Agenda

AWS re:Invent 2021 Experience

Dev & DevOps

Serverless

Compute

Networking

Databases



AWS re:Invent 2021 Experience



AWS RE:INVENT
RE:CAP

AWS re:Invent 2021 Experience



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Developers & DevOps



Amazon CodeGuru Reviewer

NOW DETECTS HARDCODED SECRETS IN JAVA AND PYTHON

Recommendations (43)

Found 1 match

< 1 > ⚙

Type = Secrets X Clear filters

.travis.yml Line: 18 [🔗](#) Security Secrets

It appears your code contains a hardcoded AWS Access Key ID. Hardcoded secrets or credentials can allow attackers to bypass authentication methods and perform malicious actions. We recommend revoking access to resources using this credential and storing future credentials in a management service such as [AWS Secrets Manager](#) [🔗](#).

[Learn more about the use of hardcoded credentials](#) [🔗](#)

Hardcoded credentials can be intercepted by malicious actors. Even after removing them from the code they may still pose a risk because an attacker might have recorded them to use them at a later point in time.

Protect your credential

Source CodeGuru

Was this helpful?

👍

👎

Amplify Studio



- Visually configure app backend
 - Model data
 - Set up auth and cloud storage
- Built on the AWS Amplify CLI
- Customize and integrate with your existing CI/CD using the AWS CDK
- Visually build a frontend UI with dozens of prebuilt components (such as buttons, forms, lists, and login)
- Import designs from Figma as React code



Preview

AWS Cloud Development Kit (CDK) v2

FOR JAVASCRIPT, TYPESCRIPT, JAVA, PYTHON, .NET AND GO

Consolidated construct library (aws-cdk-lib),
experimental modules distributed separately.

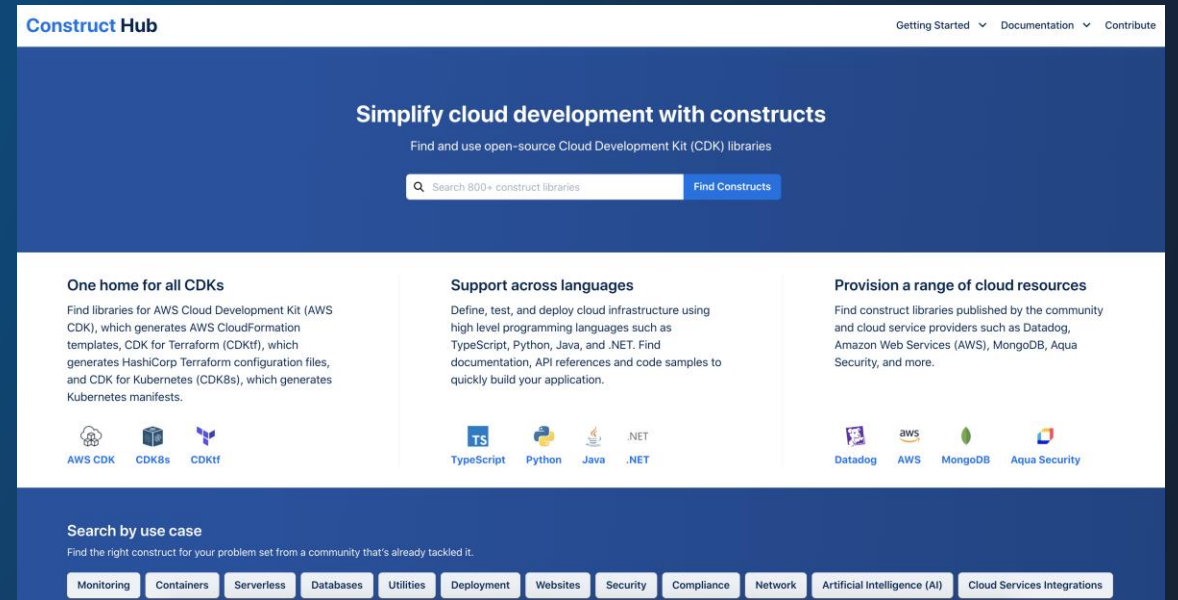
New CDK Watch functionality.



Preview

AWS CDK Construct Hub

Share open-source construct libraries with the wider cloud development community.

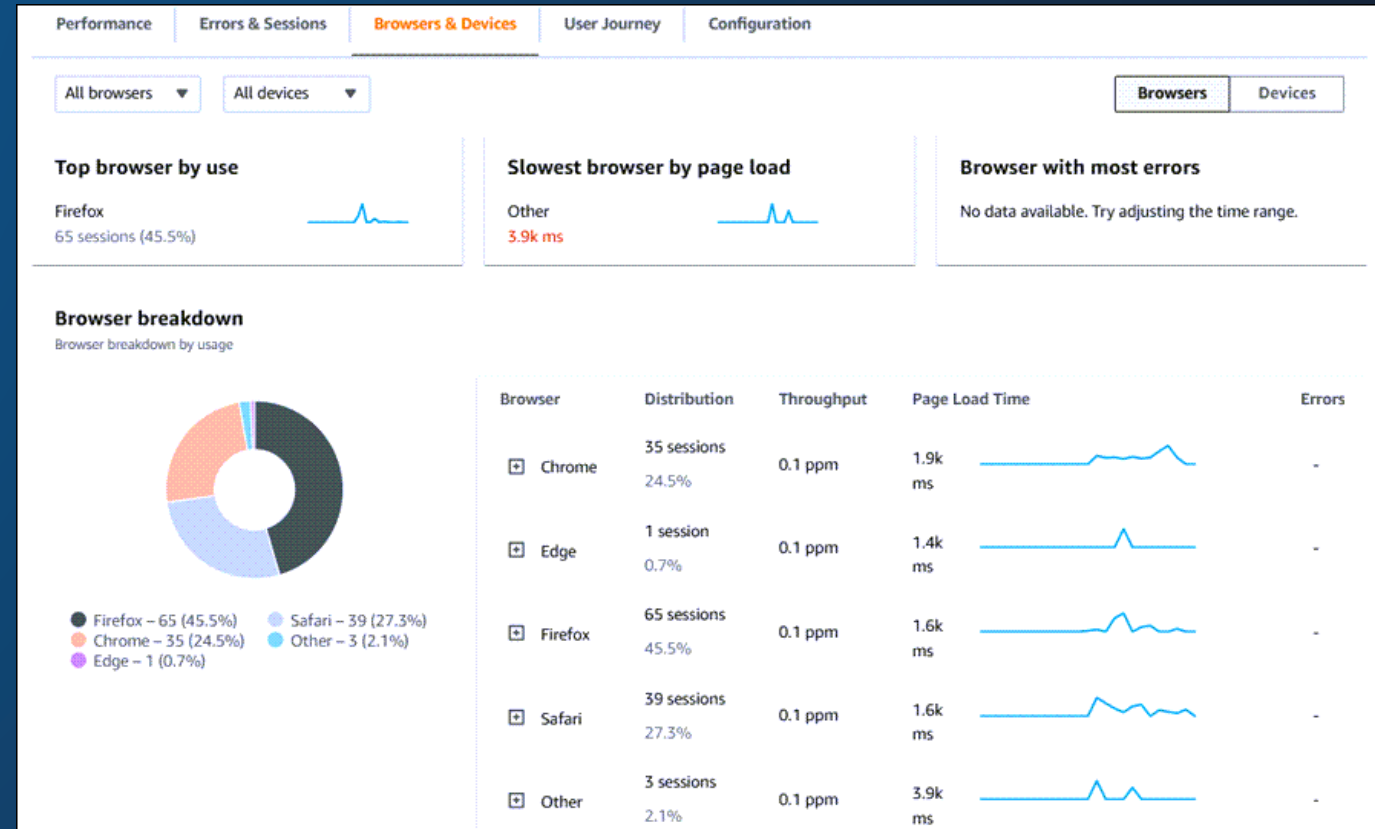


GA

CloudWatch Real User Monitoring (RUM)

Collect the metrics that give you the insights that will help you to identity, understand, and improve this experience.

Register your application by adding a code snippet of JavaScript to the header of each page



AWS SDKs

New SDKs for:



Swift



Kotlin



Rust

C++ Go Java JavaScript .NET Node.js PHP Python Ruby



Preview

Manage AWS Resources from Slack

Now supports management of resources

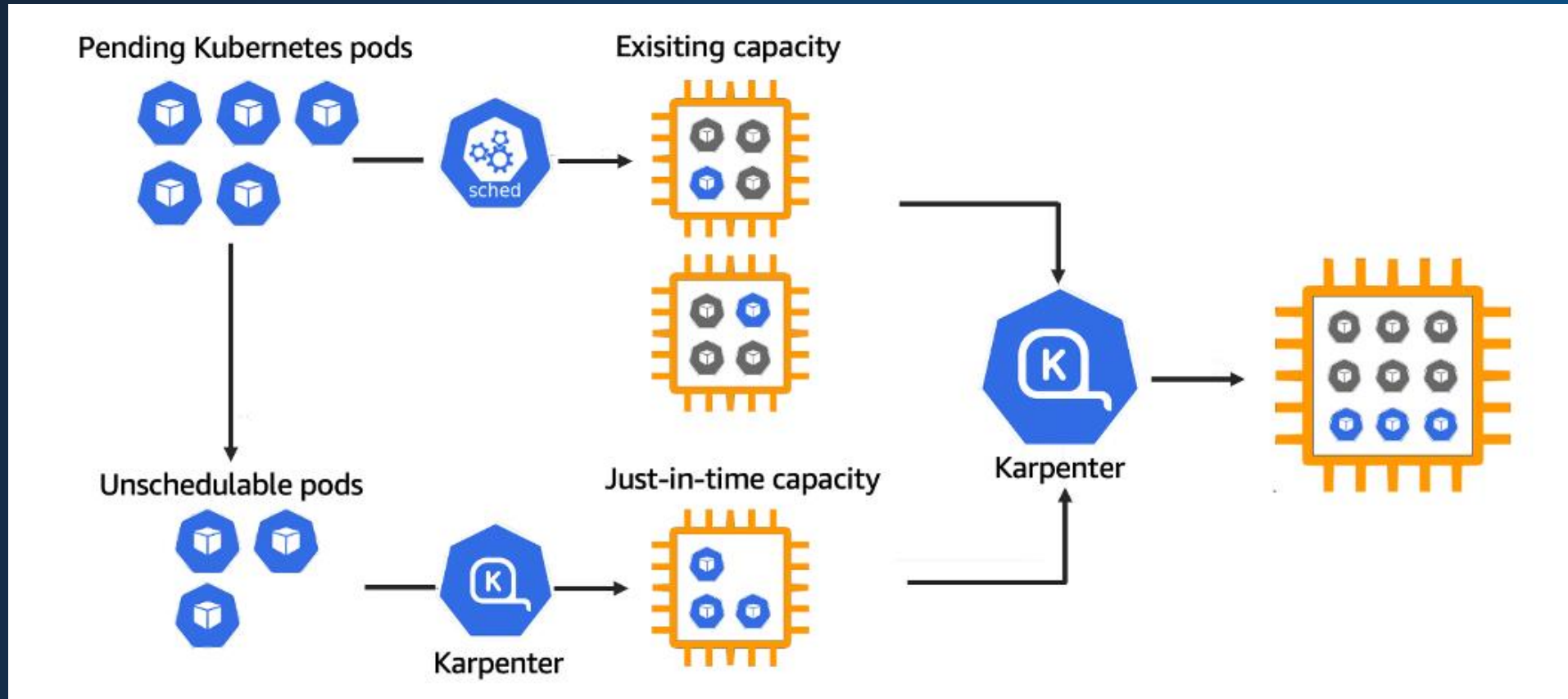
Run AWS CLI commands to scale EC2 instances, run AWS Systems Manager runbooks, and change AWS Lambda concurrency limits



Preview

Karpenter

AWS BUILT KUBERNETES AUTOSCALER



Amazon ECR – Pull Through Cache Repositories

ACCESS PUBLIC CONTAINER REGISTRIES THROUGH ECR

Public Repositories with no auth

Get the same improved performance, security and availability that ECR provides, but for public repositories



AWS Marketplace for Containers Anywhere

FIND, SUBSCRIBE TO, AND DEPLOY THIRD-PARTY KUBERNETES APPLICATIONS FROM AWS MARKETPLACE

Find, subscribe to, and deploy third-party Kubernetes applications from AWS Marketplace on any Kubernetes cluster in any environment.



Amazon EKS



Amazon EKS
Anywhere



Amazon ECS



Amazon ECS
Anywhere



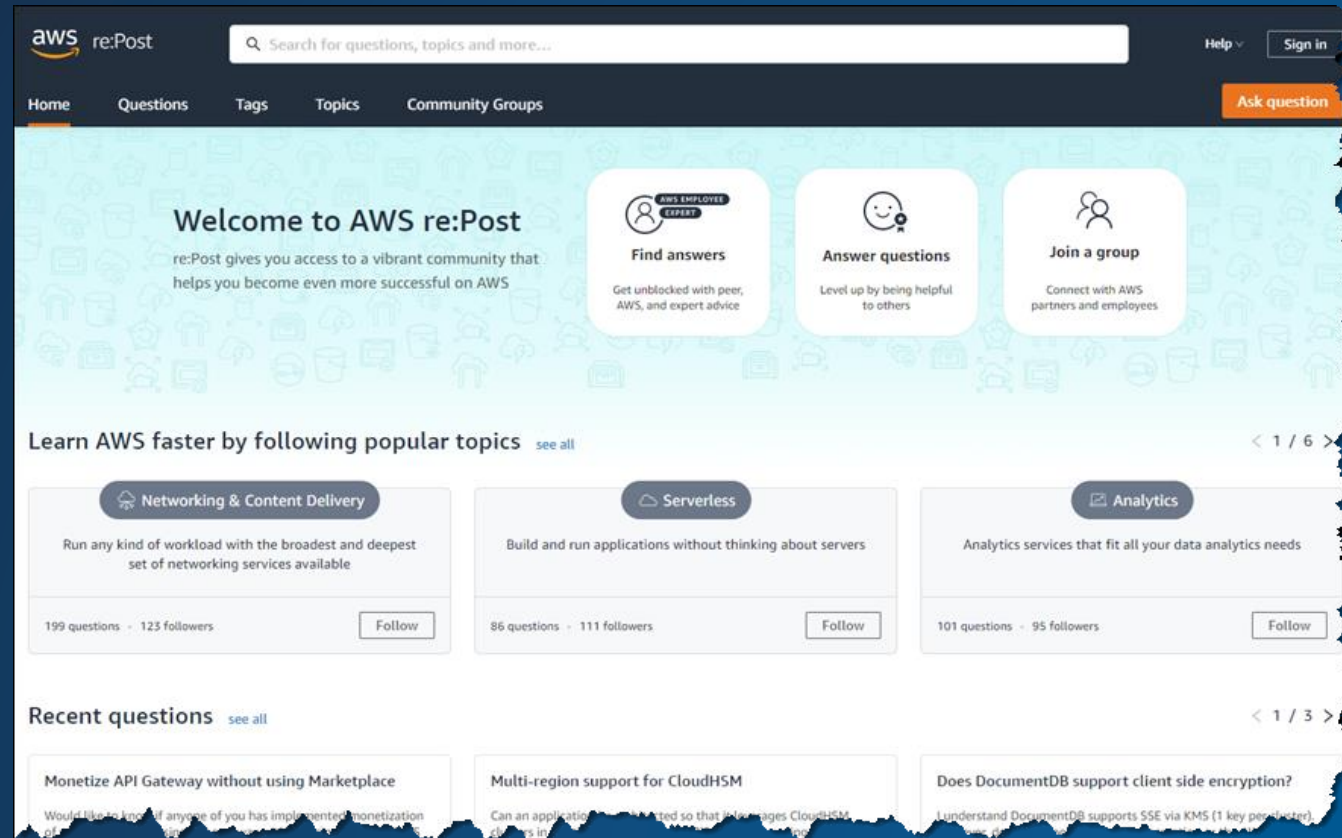
Self-managed
Kubernetes cluster
on EC2



Self-managed
Kubernetes cluster
on premises

re:Post

- Community Q&A site
- Answers from AWS and customers
- Expert reviewed
- Free!



AWS BugBust

- Identify and resolve bugs in open source projects (Java and Python)
- Competition with prizes and bragging rights
- Amazon CodeGuru will be used to identify potential bugs, which builders can select to fix
- Amazon CodeGuru will validate fix and submit PR back to source projects



AWS RE:INVENT CHALLENGE BUGJAR

Python and Java developers of all skill levels can compete to fix as many bugs as possible and win prizes, glory, and the title of Ultimate AWS BugBuster!

[Claim your first bug](#)

[Copy invite message to clipboard](#)

An illustration of a glass jar filled with various coins. The coins have different symbols: a bug, a dollar sign, a lightning bolt, and an exclamation mark. Some coins are floating out of the jar.

373
Developers

12,289
Bugs fixed

\$26,087,165
Dollars saved

AWS RE:INVENT CHALLENGE LEADERBOARD

Python and Java developers of all skill levels can compete to fix as many bugs as possible and win prizes, glory, and the title of Ultimate AWS BugBuster!

[Claim your first bug](#)

[Copy invite message to clipboard](#)

Rank	Player	Events	Bugs fixed	Total points
🏆 1st	 StevenVu	14	395	1271
🏆 2nd	 softboy	7	371	1127
🏆 3rd	 JuvChan	15	303	1039

Serverless



AWS Lambda: Event Filtering

- Filter incoming messages **before function invocation**
 - Same pattern matching rules as Amazon EventBridge
 - Define up to 5 patterns per event source mapping, up to 2048 characters each
 - Batching applied **after filtering**
- Reduce traffic to function, **reduce cost**
- Support for: Kinesis Data Streams, DynamoDB Streams, SQS

```
FleetTirePressureMapping:
  Type: AWS::Lambda::EventSourceMapping
  Properties:
    FunctionName: fleet-tire-pressure-evaluator
    BatchSize: 100
    StartingPosition: LATEST
    EventSourceArn:
      arn:aws:kinesis:...:stream/fleet-telemetry
    FilterCriteria:
      Filters:
        - Pattern: |
            {
              "data": {
                "tire_pressure": [{"numeric": ["<", 32]}]
              }
            }
```


AWS Lambda: Partial Batch Response for SQSaaS

Process information at a **record-level** instead of batch-level

Partial Batch Response feature an SQS queue will **only retain those records which could not be successfully processed**, improving processing performance.

Remove the need of repetitive data transfer, increasing throughput and making Amazon SQS message queue processing more efficient.

Available for both standard and FIFO SQS queues

○ ○ ○

```
public class ProcessSQSMessageBatch implements RequestHandler<SQSEvent, SQSBatchResponse> {  
    @Override  
    public SQSBatchResponse handleRequest(SQSEvent sqsEvent, Context context) {  
  
        List<SQSBatchResponse.BatchItemFailure> batchItemFailures  
            = new ArrayList<SQSBatchResponse.BatchItemFailure>();  
  
        String messageId = "";  
  
        for (SQSEvent.SQSMessage message : sqsEvent.getRecords()) {  
            try {  
                //process your message  
                messageId = message.getMessageId();  
            } catch (Exception e) {  
                //Add failed message identifier to the batchItemFailures list  
                batchItemFailures.add(new StreamsEventResponse.BatchItemFailure(messageId));  
            }  
        }  
  
        return new SQSBatchResponse(batchItemFailures);  
    }  
}
```



GA

Only pay for **events that match a rule**

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AWS Lambda: Ephemeral Storage

Provision between **512 MB to 10,240 MB** ephemeral storage (/tmp)

- Provision in **1 MB increments**
- Available for both zip and container packaging

Customers charged for storage provisioned beyond 512 MB

- Default of 512 MB remains same, no additional charge

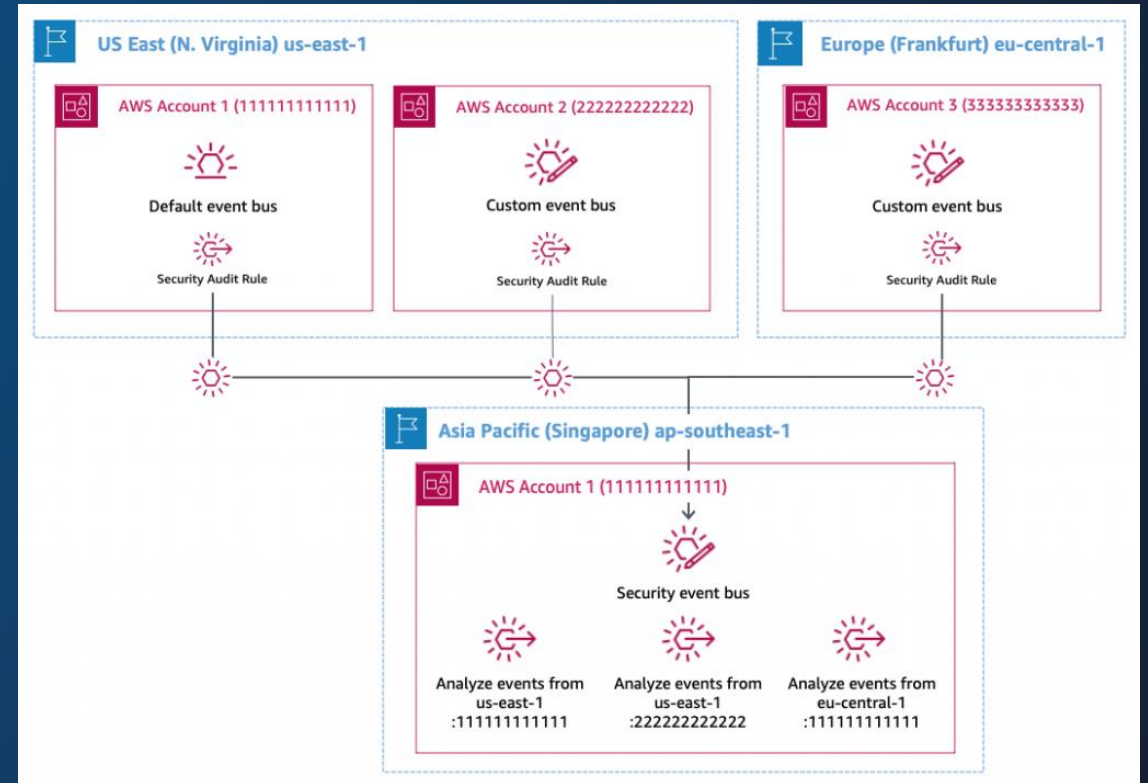
Storage is encrypted with an AWS managed key

Amazon EventBridge cross-Region support

Amazon EventBridge expands support to all Regions, except for AWS GovCloud (US) and China

Consolidate events in one central Region from any Region

Centralize their events for **auditing** and **monitoring** purposes or replicate events from source to destinations Regions to help **synchronize data across Regions**



AWS Step Functions: Integration with Athena Console

Manage Step Functions workflows from Athena console

View interactive diagrams of workflows that incorporate Athena

Launch sample projects

The screenshot displays the Amazon Athena console interface. On the left, a sidebar contains navigation links: 'Query editor', 'Workgroups', 'Data sources', and 'Related AWS resources'. Under 'Related AWS resources', 'Workflows' is highlighted with a 'New' badge, and 'Enable compact mode' is shown as an option. The main content area is titled 'Amazon Athena > Workflows' and 'Jobs'. It features a section 'Create Athena jobs with Step Functions workflows' with an 'info' link. Below this, a paragraph explains that AWS Step Functions helps orchestrate Athena queries using serverless workflows called 'state machines'. Three sample workflow diagrams are presented: 'Send query status' (a query icon branching to success and failure notification icons), 'Execute multiple queries' (a query icon branching to three parallel query icons), and 'Query large datasets' (a sequence of Glue Crawler, S3 bucket, and query icons with email notification icons). Each diagram has a 'Get started' button. Below the workflows, the 'State machines' section is visible, including a 'Create state machine' button and a table with columns 'Name', 'Type', and 'Created'.

AWS Step Functions: Sync Express support for PrivateLink

Start synchronous Express Workflows from VPC via PrivateLink without traversing public internet

Great fit with AWS SDK Integrations

Create new VPC Endpoint, but no other changes required



GA

Amazon SQS: DLQ Redrive

Effectively manage lifecycle of **unconsumed messages** in dead-letter queue (standard queues only)

Redrive messages from DLQ to source queue

- Examine unconsumed messages
- Recover from errors
- Reprocess messages

Easily inspect a sample of messages in DLQ and then move to source queue. Avoid custom re-processing scripts

▼ Redrive allow policy - Optional
Identify which source queues can use this queue as the dead-letter queue. [Info](#)

Select which source queues can use this queue as the dead-letter queue.

☐ Disabled
☒ Enabled

Redrive permission

☐ Allow all
Allow all source queues from the same account and in the same region to use this queue as the dead-letter queue

☒ By queue
Allow a list of source queues from the same account and in the same region to use this queue as the dead-letter queue

☐ Deny all
Deny all source queues from using this queue as the dead-letter queue

⚠ Warning: If any source queue that is not listed below uses this queue as the dead-letter queue, all messages moved from the source queue to the dead-letter queue will fail.

Select the ARN for each source queue.

arn:aws:sqs:us-east-1: [redacted] :my-standard-queue ▼

[Add new source queue](#)

Amazon SQS: Managed SSE

Protect sensitive data with **SQS-owned encryption keys** (SSE-SQS)

- Additional option to customer-provided encryption keys with KMS (SSE-KMS)

Create new queues with SSE-SQS or SSE-KMS

- Reduce operational burden and complexity in protecting data
- SSE-SQS alleviates need for customer to create / manage keys

Encryption - Optional
Amazon SQS provides in-transit and at-rest encryption by default. To change the type of your at-rest encryption, select the appropriate Encryption key type.
[Info](#)

Server-side encryption

☐ Disable

☒ Enable

Encryption key type

☐ Amazon SQS key (SSE-SQS)
An encryption key that Amazon SQS creates, manages, and uses for you. [Learn more](#)

☒ AWS Key Management Service key (SSE-KMS)
An encryption key protected by AWS Key Management Service (AWS KMS). [Learn more](#)

Customer master key [Info](#)

(Default) alias/aws/sqs ▼

Description
Default master key that protects my SQS messages when no other key is defined

Account
320877094064

CMK ARN
arn:aws:kms:us-east-1:320877094064:key/9f732783-0443-45b7-b43e-f97e2ec13b09

Data key reuse period

5 Minutes ▼

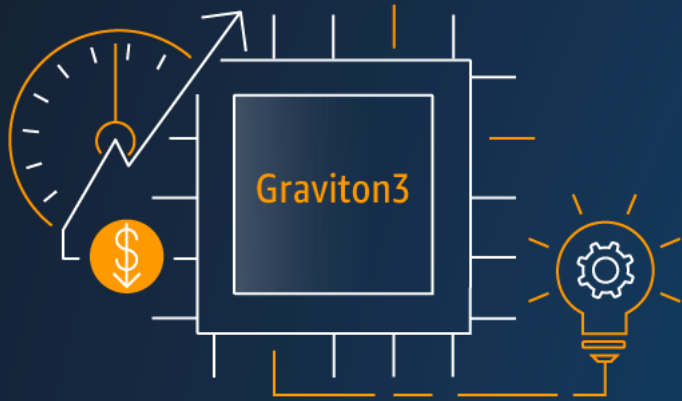
Should be between 1 minute and 24 hours.

Compute



Announcing AWS Graviton3 and Amazon EC2 C7g instances

ENABLING THE BEST PRICE PERFORMANCE FOR WORKLOADS IN AMAZON EC2



Up to 25% better performance compared to Graviton2

Up to 2x higher floating-point performance, up to 2x faster cryptographic workload performance, and up to 3x better machine learning performance compared to Graviton2

First in the cloud to feature DDR5 memory

60% more energy efficient over comparable EC2 instances

C7g instances, available in preview, will provide the best price performance for compute-intensive workloads in Amazon EC2

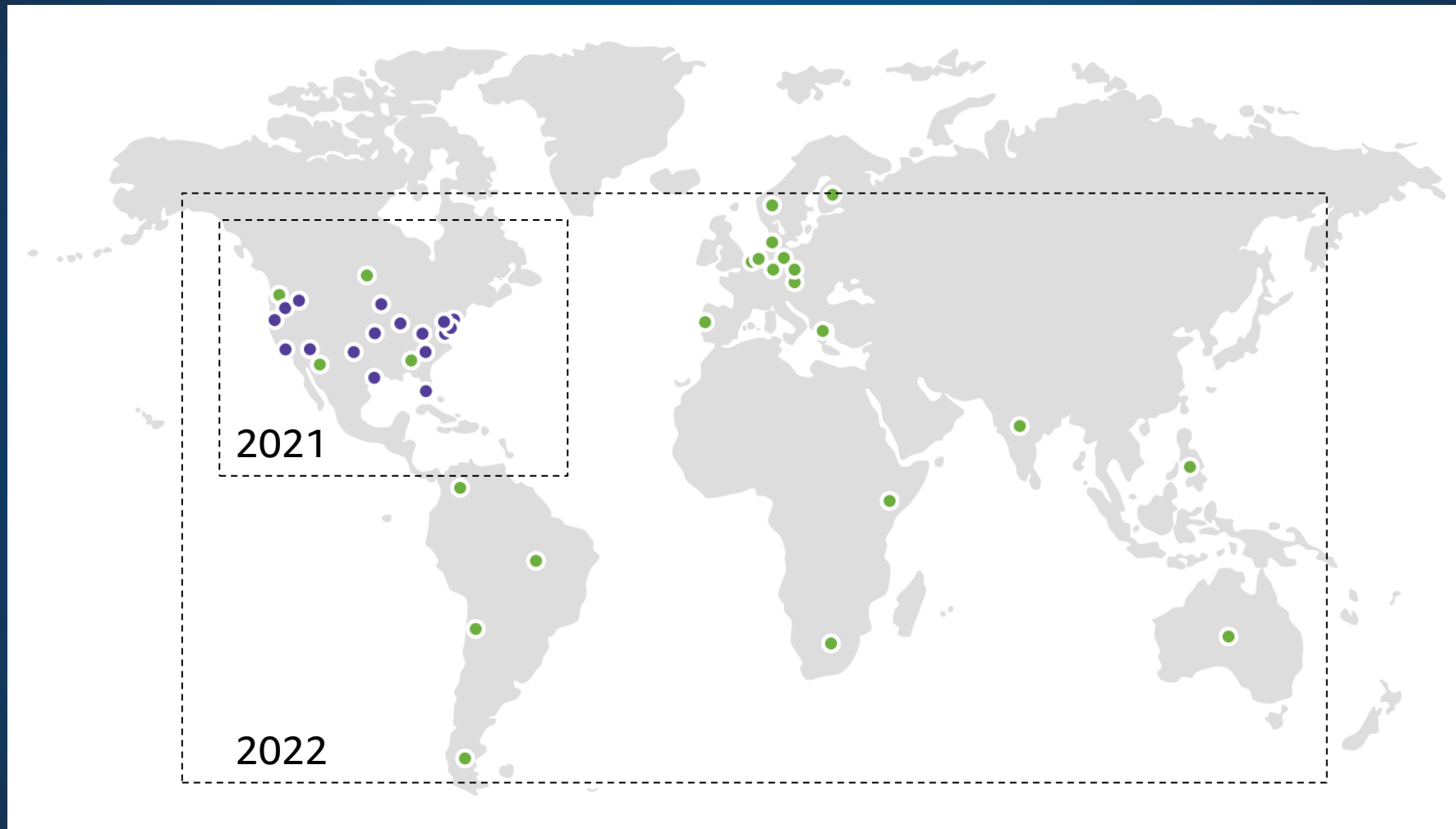


Preview

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<https://aws.amazon.com/blogs/aws/join-the-preview-amazon-ec2-c7g-instances-powered-by-new-aws-graviton3-processors/>

Local Zone Expansion



Amazon EC2 M1 Mac instances

BETTER APPLICATION BUILD PERFORMANCE AND FASTER TESTS FOR MACOS



Enjoy up to 60% better price performance over x86-based Amazon EC2 Mac instances

Allows a native ARM64 macOS environment to develop, build, test, deploy, and run macOS applications within minutes

Experience the same elasticity, scalability, reliability, and security of AWS on-demand infrastructure

AWS Compute Optimizer

RESOURCE EFFICIENCY METRICS TO ESTIMATE SAVINGS OPPORTUNITIES AND PERFORMANCE RISKS



Identify workload patterns

Recommend optimal AWS resources

Rolls up to AWS Organizations

Outputs estimated savings

Amazon CloudWatch Metrics Insights

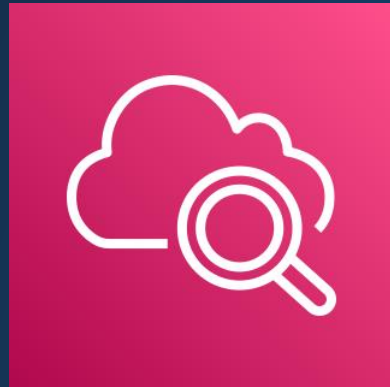
IDENTIFY TRENDS AND PATTERNS ACROSS MILLIONS OF OPERATIONAL METRICS IN REAL TIME USING SQL

Gain better visibility on your infrastructure and large scale application

- Create powerful visualisations that auto-update
- On-the-fly metric aggregation
- SQL or visual query editor
- Use for EC2 or hybrid environments



SCAN ME



Preview

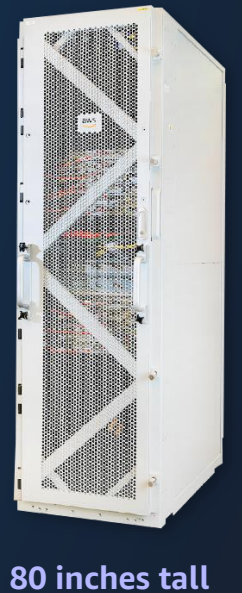
Outposts Servers

- Use the the same AWS infrastructure, services, APIs, and tools on premises
- 1RU (AWS Graviton2 processor) or 2RU (Intel processor)
- Run AWS services locally, including Amazon EC2, Amazon ECS, and edge services like AWS IoT Greengrass
- Simple device installation by either your own personnel or a third-party vendor

AWS OUTPOSTS FAMILY



42U FULL RACK



Outposts Region Expansion

- Costa Rica
- Ecuador
- Morocco
- Nigeria
- Vietnam

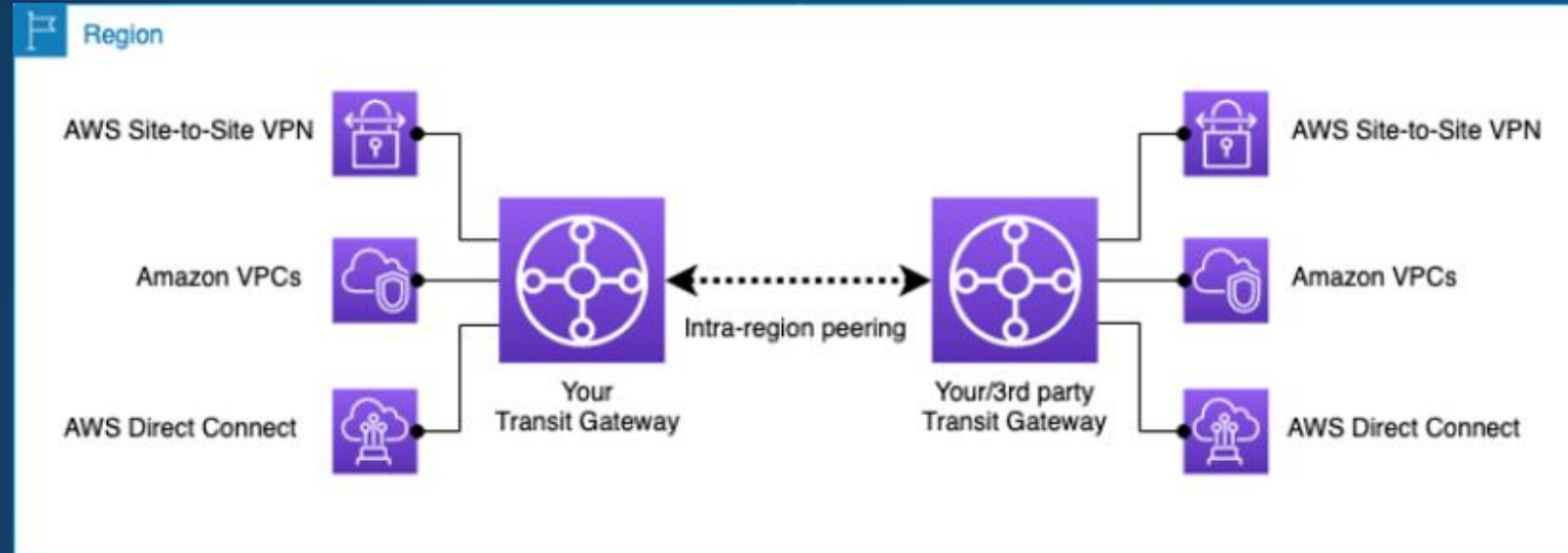


Networking



Transit Gateway Intra-Region Peering

- Transit Gateway launch: 2018
- Inter-region peering: 2020
- Intra-region peering: 2021



VPC Network Access Analyzer

- Define network scope (access pattern)
- Evaluate network interface using scope
- Automated reasoning tool – no network scan required
- Use as part of a security review or CI/CD deployment pipeline

VPC > Network Access Scopes > nis-070dc1d37ca315e86

nis-070dc1d37ca315e86 / AWS-VPC-Ingress (Amazon created)

Summary Info Actions Analyze

Network Access Scope ID: nis-070dc1d37ca315e86

Name: AWS-VPC-Ingress (Amazon created)

Description: Identify ingress paths into your VPCs from Internet Gateways, Peering Connections, VPC Service Endpoints, VPN and Transit Gateways.

► Network Access Scope definition

Latest analysis Past analyses Tags

Analysis details

Analysis ID: nisa-02f2848b0a0a0e9ba

Last analysis date: November 25, 2021, 10:43 (UTC-08:00)


Last analysis result: Findings detected Limited findings are displayed Info

Analysis status: Complete

Network Interfaces analyzed: 28

Filter findings by category Info

This chart shows the number of occurrences of various resources in the findings. Select resource(s) to filter for findings containing the resource.



Resource Type	Count
Security Groups	234
Network ACLs	171
Transit Gateway Attachments	111
Network Interfaces	100
Route Tables	76
Application Load Balancers	42
Transit Gateway RouteTables	30
VPC Peering Connections	28
Classic Load Balancers	25
Internet Gateways	12

Findings (100) Info

Filter findings by resource types or specific resource

Source	Destination	Path details
igw-0db9e65e51caa59ba ...	eni-0096ad03d76e70c75 ...	igw-0db9e65e51caa59ba → eni-0096ad03d76e70c75 → SG
igw-0db9e65e51caa59ba ...	eni-01972fa63f872a4a0 (...)	igw-0db9e65e51caa59ba → eni-01972fa63f872a4a0 → SG
igw-0db9e65e51caa59ba ...	eni-00e6fe2e80e5db629 ...	igw-0db9e65e51caa59ba → eni-00e6fe2e80e5db629 → SG
tgw-attach-01241698f82...	eni-00e6fe2e80e5db629 ...	tgw-attach-01241698f82 → eni-00e6fe2e80e5db629 → SG
tgw-attach-01241698f82...	eni-00e6fe2e80e5db629 ...	tgw-attach-01241698f82 → eni-00e6fe2e80e5db629 → SG
tgw-attach-0a3e70f3d92...	eni-00e6fe2e80e5db629 ...	tgw-attach-0a3e70f3d92 → eni-00e6fe2e80e5db629 → SG
tgw-attach-0a3e70f3d92...	eni-0096ad03d76e70c75 ...	tgw-attach-0a3e70f3d92 → eni-0096ad03d76e70c75 → SG
tgw-attach-0a3e70f3d92...	eni-00e6fe2e80e5db629 ...	tgw-attach-0a3e70f3d92 → eni-00e6fe2e80e5db629 → SG
tgw-attach-0a3e70f3d92...	eni-030294b88ef014fab (...)	tgw-attach-0a3e70f3d92 → eni-030294b88ef014fab → SG
tgw-attach-01241698f82...	eni-030294b88ef014fab (...)	tgw-attach-01241698f82 → eni-030294b88ef014fab → SG

Select a path from the findings table.

Private 5G

- Thousands of devices
 - Low latency
 - High bandwidth
- AWS provides:
 - Cell radio units
 - Servers
 - 5G core and Radio Access Network (RAN) software
 - SIM toolkit



Data Out Transfer Price Reduction

- CloudFront
 - 1TB of data transfer out
 - 10M HTTP/HTTPS requests
 - 2M CloudFront Functions invocations
- EC2, S3, Load balancers, etc. (non-CloudFront)
 - 100GB of data transfer out
- Per month
- Perpetual



Recycle Bin for EBS Snapshots

QUICK RECOVERY OF DELETED SNAPSHOTS



REDUCE THE RISK OF
DATA LOSS FROM
ACCIDENTAL
DELETIONS

Automatically **keep** deleted snapshots for a **retention period** that you specify

Predefined rules specify retention periods for **all snapshots** or specific **"tagged" snapshots**

Recover deleted snapshots before your retention period expires

Restrict access to Recycle Bin Rules and resources using **AWS Identity and Access Management (IAM) roles**

Databases



Amazon RDS Custom

Amazon RDS Custom is a managed database service for legacy, custom, and packaged applications that require access to the underlying operating system and database environment

Amazon RDS Custom is available for RDS for Oracle and for SQL Server



Amazon DevOps Guru for RDS

ML-powered database advisor for Amazon RDS
First released for Amazon Aurora

Automatically detects and diagnoses hard-to-find performance bottlenecks and operational issues

Delivers insights and recommendations to help resolve issues in minutes

Uses ML models informed by years of operating thousands of databases for Amazon.com

No ML experience required

Continuously monitors database workloads at scale



GA

Amazon DynamoDB Standard-Infrequent Access (Standard-IA) table class



Lower storage costs

The Standard-IA table class offers 60% lower storage costs than DynamoDB Standard tables.



No performance trade-offs

Standard-IA tables offer the same performance, durability, data availability, and massive scalability as existing DynamoDB Standard tables.



No developer overhead

Switch between table classes with a single click in the DynamoDB console, or using the AWS CLI or AWS SDK. Also, use the same DynamoDB APIs and service endpoints.

Amazon Redshift Serverless

Automatically provisions and scales data warehouse capacity



Preview



Amazon Redshift Serverless – Easy Start Experience



No compromises

SQL features

Performance at scale

Scalability

Analyze all your data

Security

Easy to get started



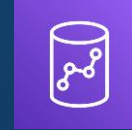
**Developer and
business analyst**

Activate Amazon
Redshift Serverless for
your AWS account



BI tool

Connect from your
favorite BI tool or Amazon
Redshift Query Editor



Amazon Redshift

Load data seamlessly and
Amazon Redshift executes
queries by automatically
provisioning capacity



Pay

Pay for compute and
storage used during analysis



Preview

Thank you!



📅 27 January, 2022 | 10:00 - 13:00 CET

Register now

<https://pages.awscloud.com/EMEA-field-OE-reInvent-reCap-EEM-202201-reg-event.html>

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