



Implementing cloud security best practices such as data encryption, identity, and access management (IAM), and security incident response

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Introduction

- In the era of cloud dominance, security is paramount. Our presentation focuses on vital cloud security aspects: understanding the challenges, the significance of data encryption for confidentiality and integrity, best practices in Identity and Access Management (IAM), and strategies for Security Incident Response.
- Real-world case studies provide practical insights. Join us to gain a concise yet comprehensive understanding of cloud security, empowering you to implement effective measures in your cloud environments



Identity and Access Management

IAM is a framework of policies, processes, and technologies that manage and secure digital identities. It involves defining and managing user roles, permissions, and access to ensure that only authorized individuals or systems can access specific resources.

IAM helps organizations control user access, enforce security policies, and streamline user authentication. It minimizes the risk of unauthorized access and ensures proper governance over user identities



Security Incident Response Mechanisms

Security incident response is a set of procedures and tools designed to identify, manage, and recover from security incidents. It involves a coordinated approach to quickly and effectively respond to and mitigate the impact of security breaches or incidents.

Importance: Rapid response is crucial to limit the damage caused by security incidents. A well-defined incident response plan helps in detecting, containing, eradicating, recovering, and learning from security events, ensuring a resilient and secure environment.



Why we need Cloud Security

TECHNOLOGY

After Data Breach Exposes 530 Million, Facebook Says It Will Not Notify Users

APRIL 9, 2021 · 11:58 PM ET



Emma Bowman



530 000 000

SOUTH KOREA





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Alibaba Falls Victim to Chinese Web Crawler in Large Data Leak

Software developer scrapes 1.1 billion pieces of user data, including IDs and phone numbers, over eight months

By [Yan Qiu](#) and [Michael H. Kohn](#)



Cutting Edge Database Practices

The Only Password Manager you need!

Never Forget, or remember a password ever again with Anti Brutus. A password Manager unlike any other, with a focus on security and ease of use. Built by a team of **Bleeding edge Cyber security Professionals from MIT.**

Head over to your Vaults to Begin!

Vaults →



How Do we do it?



Database Encryption (AES256) with Hashing, Salting, Envelope Encryption, DEK, and KEK



Reset Filters Records: 8

	user_id	pass_id	vault_id	website_url	description	password	username	pass_name	icon	pass_date
	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>	<div>Search column...</div>
1	1	1	6	f1200551789e7bff761cc252d562...	a	b47b2bfab451e4b57...	a	a	https://t3.gstatic.com...	2023-09-04
2	1	2	6	78f4321ecb9082bf49289245eb9...	d	78f4321ecb9082bf49...	d	s	https://t3.gstatic.com...	2023-09-04
3	2	3	5	342c339e33476c17cb8f2875459...	fasdfasdasdf	69bafb23977a65f0a6...	test123	test	https://t3.gstatic.com...	2023-09-04
4	2	4	4	4e642657f704f539c7b76417fc7c...	jlafskdjf	3966df669fad1c3896...	jflkasdjf	fjaskldjf	https://t3.gstatic.com...	2023-09-04
5	4	6	10	9afdd53a9de87568f41f636af4c9...	Sadfasdfsaf	3b9e62c4361f12eeca...	Matauri	bumble	https://t3.gstatic.com...	2023-09-04
6	5	7	15	d883623e7e755177382d29dba0...	asdf	f86a4b95dbafd7faa8...	adfs	asdf	https://t3.gstatic.com...	2023-12-01
7	5	8	13	42c1ec512beab2577523c20d703...	something	f72c196bc092017037...	krishnaraj	amazon	https://t3.gstatic.com...	2023-12-01
8	5	9	13	d883623e7e755177382d29dba0...	sdf	d883623e7e7551773...	asdf	adsf	https://t3.gstatic.com...	2023-12-01



```
1 // Function to hash password with salt
2 function hashPassword(password, salt) {
3   const hash = crypto.createHash("sha256");
4   hash.update(password + salt);
5   return hash.digest("hex");
6 }
```



```
1
2 function decrypSalt(encryptedSalt, kek) {
3   const decipher = crypto.createDecipher("aes-256-cbc", kek);
4   let salt = decipher.update(encryptedSalt, "hex", "utf8");
5   salt += decipher.final("utf8");
6   return salt;
7 }
8
```



```
1 function encryptUsingKEK(dek, kek) {  
2   const cipher = crypto.createCipher("aes-256-cbc", kek);  
3   let encryptedDEK = cipher.update(dek, "utf8", "hex");  
4   encryptedDEK += cipher.final("hex");  
5   return encryptedDEK;  
6 }
```



```
1 function decryptDEK(DEK, KEK) {  
2   const decipher = crypto.createDecipher("aes-256-cbc", KEK);  
3   let decryptedDEK = decipher.update(DEK, "hex", "utf8");  
4   decryptedDEK += decipher.final("utf8");  
5   return decryptedDEK;  
6 }
```




```
1 function generateDEK(email, salt, string) {  
2   const key = email + salt;  
3   const cipher = crypto.createCipher("aes-256-cbc", key);  
4   let dek = cipher.update(string, "utf8", "hex");  
5   dek += cipher.final("hex");  
6   return dek;  
7 }
```





Security Incident Response Mechanisms




Firestore IAM



Project shortcuts

 **Authentication** **Realtime Database** **Test Lab** **Performance** **Crashlytics**

What's new

 **Extensions** NEW **Release Monitori...** NEW

Product categories

Build

There All Along ▾

Realtime Database

Data**Rules**

Backups

Usage

 **Extensions**

```
1  {
2    "rules": {
3      "users": {
4        "$uid": {
5          ".read": "$uid === auth.uid",
6          ".write": "$uid === auth.uid",
7        }
8      }
9    }
10 }
```

<https://there-all-along-default-rtdb.asia-southeast1.firebaseio.com/>

▼ — users

▼ — yJ34fJr7t1S5J4TxYLdu6Q1TBG02

▼ — forms

▼ — -NgmadQ13MppimWMf8vF

▼ — attributes

0: "ID"

1: "Date"

2: "Time"

▼ — data

▼ — -Ngmiox8tHUKBv2R61JS

Date: "hi"

Rules Playground

Simulation type

get

Location

/b/attendance-assistant-
3b3a3.appspot.com/o

path/to/resource

Authenticated

Run

```
1 rules_version = '2';
2
3 // Craft rules based on data in your Firestore database
4 // allow write: if firestore.get(
5 //   /databases/(default)/documents/users/${request.auth.uid}).data.isAdmin;
6 service firebase.storage {
7   match /b/{bucket}/o {
8
9     // This rule allows anyone with your Storage bucket reference to view, edit,
10    // and delete all data in your Storage bucket. It is useful for getting
11    // started, but it is configured to expire after 30 days because it
12    // leaves your app open to attackers. At that time, all client
13    // requests to your Storage bucket will be denied.
14    //
15    // Make sure to write security rules for your app before that time, or else
16    // all client requests to your Storage bucket will be denied until you Update
17    // your rules
18    match /{allPaths=**} {
19      allow read, write: if request.time < timestamp.date(2024, 3, 26);
20    }
21  }
22 }
```



AWS IAM

console.seed.run

3. Configure the stages

Add a dev and prod stage for your app. You can add additional stages later.

Do you want to configure the settings manually or copy them from another app?

Configure Manually

Copy Settings

ADD A DEVELOPMENT STAGE

STAGE NAME

dev

Deployed to `--stage dev`

AWS IAM ROLE

[Help me create an IAM Role](#)

ADD A PRODUCTION STAGE

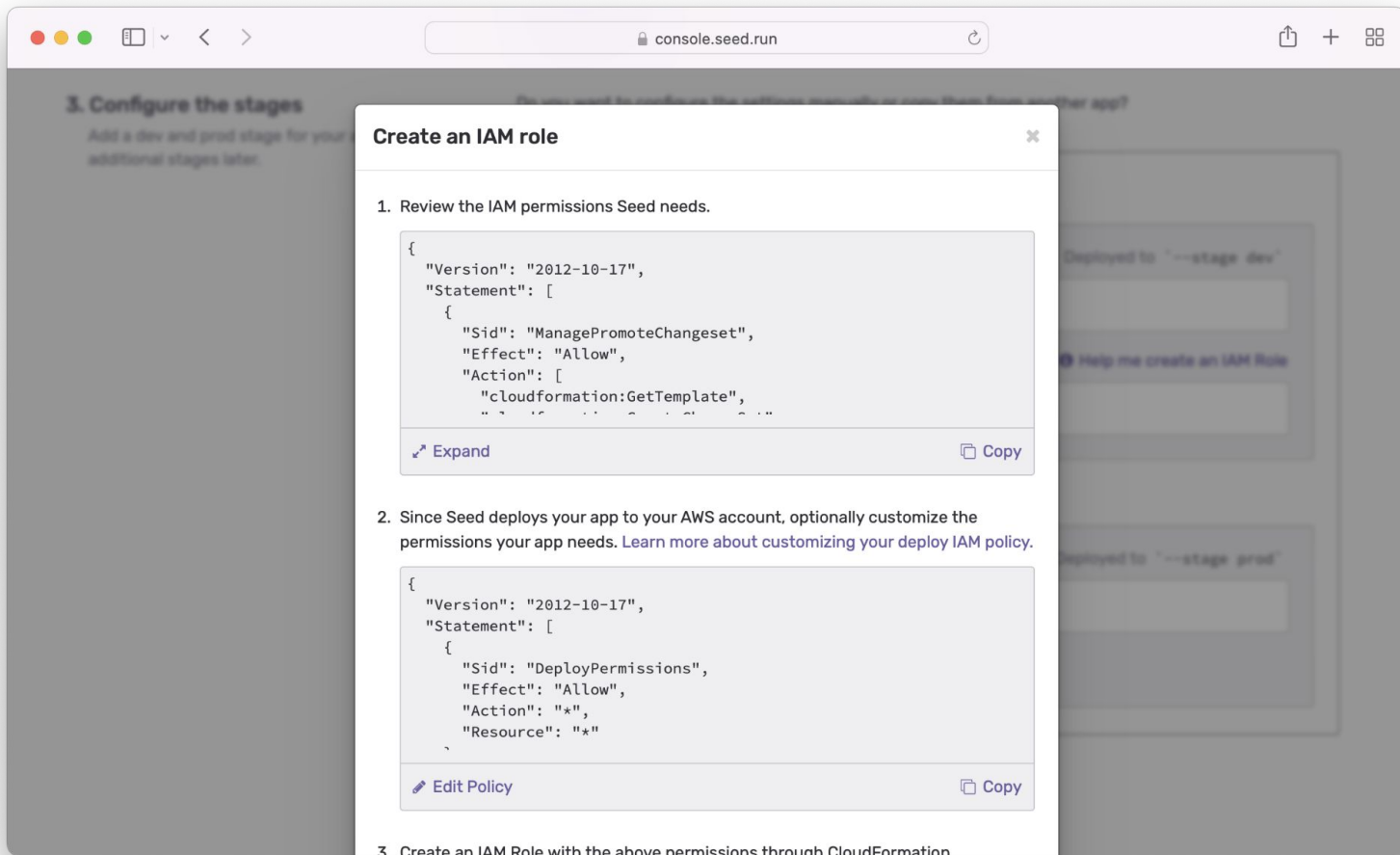
STAGE NAME

prod

Deployed to `--stage prod`

☒ Use the same IAM credentials as the dev stage

Add a New App





Azure IAM



example-group | Access control (IAM)

Resource group



Add



Download role assignments



Edit columns



Refresh



Remove



Got feedback?

Overview

Activity log

Access control (IAM)

Tags

Events

Settings

Deployments

Policies

Properties

Locks

Cost Management

Cost analysis

Cost alerts (preview)

Budgets

Check access

Role assignments

Roles

Deny assignments

Classic administrators

Number of role assignments for this subscription ⓘ



Type : All

Role : All

Scope : All scopes

Group by : Role



Showing a filtered set of results. Total number of role assignments: 16

1 items (1 Users)



Name

Type

Role

Scope



Alain

User

Storage Blob Data Reader ⓘ This resource

Developers



Sourab Karad



Parth Zarekar



Credits and Thanks



References

[Anti Brutus \(anti-brutus.vercel.app\)](https://anti-brutus.vercel.app)

[There All Along - Realtime Database - Firebase console \(google.com\)](https://firebase.google.com/docs/database/realtime)

[ParthZarekar/Anti-Brutus: Project for Full Stack Development. Similar to Password managers like Bitwarden. Hosted Locally. \(github.com\)](https://github.com/ParthZarekar/Anti-Brutus)