

Business Email Compromise

Prevent - Detect - Respond







Threat Vectors [consolidated]

- Unpatched Vulnerabilities
- Misconfiguration
- Identity Attacks

PM 149	9 ActivatePositions.csv	
	77L L (L2 L) 1 (7) (2) (7)	
	Aspnet client Department.csv	
^M 3,536,968	Employee Fynor-	
M 997 514		
51,545	Inort coart in thours.csv	
5/,256	JobCodes, car	12
M 57,256	INGITIOGETIONHOUIS.CSV	

- 1. Invoke Trust and/or Trigger Emotional Response
- 2. Override Decision-Making w/Call to Action
- 3. Manipulate Identity/Actions for Financial Gain
- 4. Use Compromised Identity to Invoke Trust

```
... REPEAT ...
```

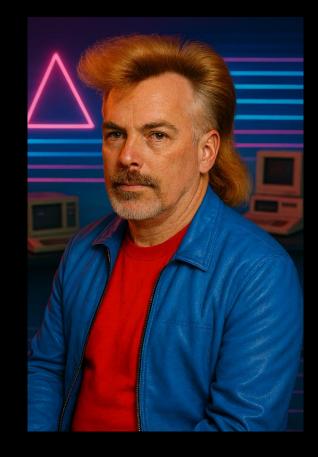
"you can't stop 2 seconds of stupid"



"Things can only get better worse."



~ Patterson Jones



Agenda

- Prevention Strategies
- Detect/Respond
- M365 Tips & Tricks
- Resources
- Appendix [Anatomy of a BEC]





"strive for perfection...
come within a quarter inch"

Patterson Cake

Incident Response Contrarian

Prevention Strategies

know your enemy and yourself

- 1. Invoke Trust and/or Trigger Emotional Response
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```
... REPEAT ...
```

"you can't stop 2 seconds of stupid"

- 1. Invoke Trust and/or Trigger Emotional Response
 It's probably coming from someone they know/trust.
 You're probably not fixing this one directly.
- 2. Override Decision-Making w/Call to Action
- 3. Manipulate Identity/Actions for Financial Gain
- 4. Use Compromised Identity to Invoke Trust
- [... REPEAT ...]

"you can't stop 2 seconds of stupid" but you should still try!

Your enemy and yourself ...

- 1. Invoke Trust and/or Trigger Emotional Response
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```
[ ... REPEAT ... ]
```

Tell them a story! [funny ... happy ... sad]

Make it personal/relatable!

Be succinct!

```
"May I have your..."

Credit Card Number? \\

Social Security Number? \\

Username/Password? \\
```

GUARD THESE THINGS LIKE YOUR FUTURE DEPENDS ON IT

Because it does!

- 1. Invoke Trust and/or Trigger Emotional Response
- 3. Manipulate Identity/Actions for Financial Gain
- 4. Use Compromised Identity to Invoke Trust
- [... REPEAT ...]

MFA = One layer of Defense in Depth

- 1. Invoke Trust and/or Trigger Emotional Response
- 2. Override Decision-Making w/Call to Action
- 3. Manipulate Identity/Actions for Financial Gain

 ***Implement Multi-Factor-Workflow for

 ALL IMPORTANT transactions.***
- 4. Use Compromised Identity to Invoke Trust [... REPEAT ...]

- 1. Invoke Trust and/or Trigger Emotional Response
- 2. Override Decision-Making w/Call to Action
- 3. Manipulate Identity/Actions for Financial Gain

```
REPEAT ....
```

Newly Created Inbox-Rules with Short/Unusual Names Bulk Outbound Mail Messages (especially with links)

"you can't stop 2 seconds of stupid" but you should still try!

Detection & Response

simple...effective...repeatable

Threat Report ["the wild"]

- BEC Standard Operating Procedures
- BEC "Identifiers" (UEBA)
- M365 Investigative Tips

```
[ ... "the weeds" ... ]
```

BEC SoP ["the wild"]

- Observes User Behavior (often a few days to two weeks)
- Explores M365 Content
- Impersonates User in \$\$\$ Transactions
- Hides Actions From User (Inbox-Rules)*
 - Favorite Name = "."
 - Moves mail to "unused" folder, e.g. "RSS Feeds"
- Registers M365 Applications (Search/Steal Data)
- Impersonates User to Phish Contacts



BEC Investigative Questions [???]

- Have we been compromised?
- If yes, then:
 - What accounts have been impacted?
 - What unauthorized access occurred?
 - What unauthorized actions occurred?



M365 Identifiers [UEBA]

- Username/Password
- Browser/OS [User-Agent String]
- Source IP Address
- MFA Type/Device
- Session Cookie



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BEC Investigative Questions [???]

- Have we been compromised? Yes [Firefox/Linux ... Netherlands]
- If yes, then:
 - What accounts have been impacted?
 - What unauthorized access occurred?
 - What unauthorized actions occurred?



M365 Investigative Tips

simple...effective...repeatable

```
#1 Acquisition - SIGN-IN LOGS:
```

Entra Admin\Sign-In Logs ...

- Add all "Columns"
- Set Date to Max Range [note 100K max entries]
- Download in CSV & JSON [x6 each]

4/13/2025, 7:27:03 AM 55286b0e-4f43-4214... Patterson Cake

4/13/2025, 7:25:16 AM 3e436c6e-eeac-4efc-... Patterson Cake

4/12/2025, 6:24:39 AM c7f85616-8148-4cf7-... Patterson Cake

79cebbbb-5667-4c1...

681562b0-96d1-44c...

5bc8bc93-bba3-43d...

ae8b671a-457c-440f... Patterson Cake

4/8/2025, 6:40:08 PM

4/6/2025, 2:01:34 PM

4/6/2025, 2:01:33 PM

4/6/2025, 2:01:11 PM



<<



All users

Audit logs

Sign-in logs

X Diagnose and solve problems

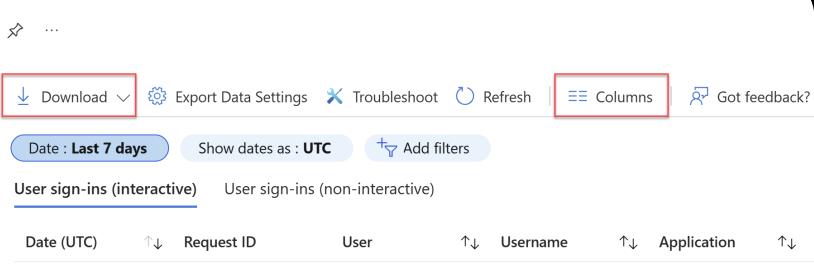
Deleted users

Password reset

User settings

Bulk operation results

New support request



Benjamin Cake

Patterson Cake

Patterson Cake

pc@securecake.com

pc@securecake.com

pc@securecake.com

bcake@haven-usa.c...

pc@securecake.com

pc@securecake.com

pc@securecake.com

Azure Portal

Azure Portal

Office 365 Exchange ...

Office 365 Exchange ...

Office 365 Exchange ...

Office 365 Exchange ...

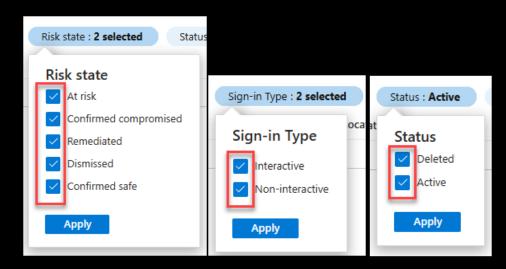
One Outlook Web

#2 - Acquisition - AUDIT LOGS:

- Entra Admin\Audit Logs ...
 - Add all "Columns"
 - Set Date to Max Range [note 250K max records]
 - Download in CSV & JSON [x1 each]

#3 Investigation - SECURITY REPORTS:

- Entra Admin\Security ...
 - Risky Users
 - Risky Sign-Ins



IMPORTANT

	Manage						
	T	Identity Secure Score					
	↔ >	Named locations					
	4	Authentication methods					
	Û	Multifactor authentication					
	ģ=	Certificate authorities (classic)					
	<u>p=</u>	Public key infrastructure (Preview)					
	Report						
ľ	Å	Risky users					
ı	Å	Risky workload identities					
L	₹	Risky sign-ins					

Date (UTC)	Application	IP address	Location	Risk state	Risk level (Detection type(s)
2024-08-07T13:38:23Z	OfficeHome	13.57.246.62	San Jose, California, US	Remediated	Low	Unfamiliar sign-in properties
2024-08-07T13:38:19Z	OfficeHome	13.57.246.62	San Jose, California, US	Remediated	Low	Unfamiliar sign-in properties, Atypical travel
2024-08-06T20:57:22Z	Office 365 Exchange Online	3.80.218.146	Ashburn, Virginia, US	Remediated	Medium	Unfamiliar sign-in properties
2024-08-06T20:57:20Z	Office 365 Exchange Online	3.80.218.146	Ashburn, Virginia, US	Dismissed	Medium	Unfamiliar sign-in properties, Atypical travel
2024-08-06T19:10:47Z	OfficeHome	54.163.19.39	Ashburn, Virginia, US	Remediated	Medium	Unfamiliar sign-in properties, Atypical travel

BECUEBA - Entra ID

["have we been compromised" - "what unauthorized access occurred"] #4 Investigation - SIGN-INS:

- Username/Password
- Browser/OS [User-Agent String]
- Source IP Address
- MFA Type/Device
- Session Cookie

8/21/2024, 7:43:47 PM pc@securecake.com	Office 365 Exchange	Success	44.223.33.132	Ashburn, Virginia, US	Linux	Chrome 118.0.0
8/21/2024, 7:17:30 PM pc@securecake.com	OfficeHome	Interrupted	44.223.33.132	Ashburn, Virginia, US	Windows10	Chrome 127.0.0
8/17/2024, 4:04:57 PM pc@securecake.com	Office365 Shell WCS	Success	172.221.112.23	Grand Junction, Colo	Windows10	Edge 127.0.0
8/17/2024, 4:04:57 PM pc@securecake.com	Office365 Shell WCS	Success	172.221.112.23	Grand Junction, Colo	Windows10	Edge 127.0.0

```
BECUEBA - Entra ID
["what unauthorized access/actions occurred"]
#5 Investigation - AUDIT LOGS:
```

- 'Update User' [MFA changes?]
 - StrongAuthenticationUserDetails ... NewValue
- 'Add Service Principal' [App Registrations?]
 - DisplayName ... NewValue
- 'Add App Role Assignment Grant to User' [App Registrations?]
 - ServicePrincipal ... ID

2024-08-12T15:55:06	Core Directory	UserManagement	Reset user password	Success	User	
2024-08-09T14:13:57	Core Directory	UserManagement	Add app role assignment grant to user	Success	ServicePrincipal	eM Client
2024-08-06T21:16:29	Core Directory	UserManagement	Update user	Success	User	

Unified Audit Log (UAL) ["what unauthorized access/actions occurred"] #6 Acquisition - UAL:

- Purview*
- PowerShell*
- Graph API

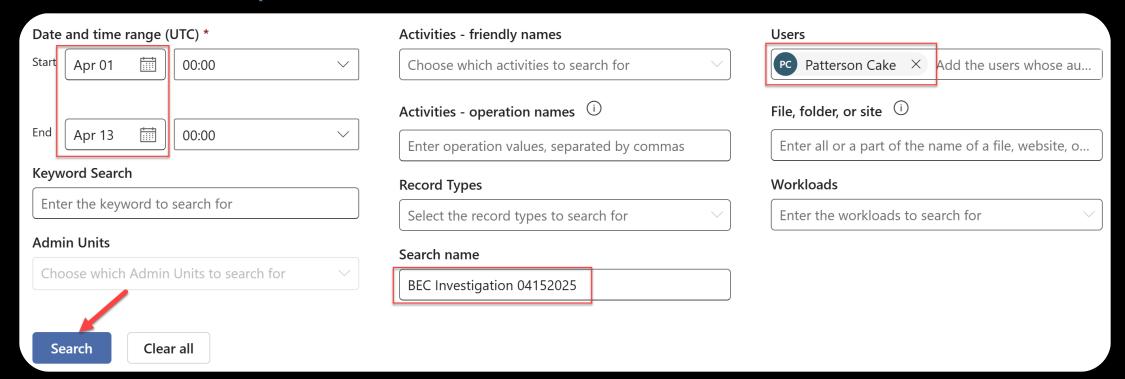
Unified Audit Log (UAL) - PSA

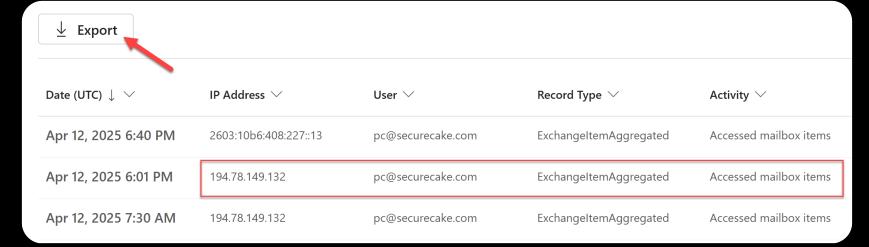
Audit Log Record Type [RecordType]

- Exchange Admin [1]
- Entra Id Events [8]
- Security Compliance Alerts [40]

https://dub.sh/m365-recordtype

Purview - Compliance "Audit"





```
Unified Audit Log (UAL)
["what unauthorized access/actions occurred"]
#6 Acquisition & Analysis - UAL:
```

- PowerShell→SOF-ELK [up to 365 days retention]
 - 'New-InboxRule' ... Name: Name, Value; FromAddressContainsWords

https://git.new/m365-bec

Resources

https://www.blackhillsinfosec.com/blog

1: wrangling-the-m365-ual-with-powershell-and-sof-elk-part-1-of-3

2: wrangling-the-m365-ual-with-powershell-and-sof-elk-part-2-of-3

3: wrangling-the-m365-ual-with-powershell-and-sof-elk-part-3-of-3

https://git.new/m365-bec

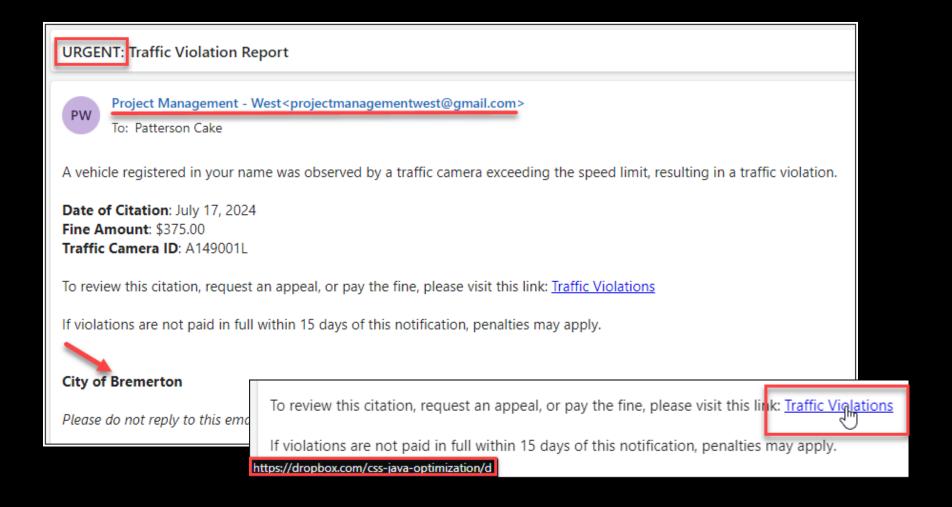
PWYC Workshop – M365 BEC - October 17, 2025 [4 Hour]

Anatomy of M365 BEC

know your enemy...step-by-step

Anatomy of a Business Email Compromise

#1: Trigger an emotional response with call to action



[... "someone you know" ...]

URGENT: Traffic Violation Report



Project Management - Westctmanagementwest@gmail.com>

To: Patterson Cake

A vehicle registered in your name was observed by a traffic camera exceeding the speed limit, resulting in a traffic violation.

Date of Citation: July 17, 2024

Fine Amount: \$375.00

Traffic Camera ID: A149001L

To review this citation, request an appeal, or pay the fine, please visit this link: <u>Traffic Violations</u>

If violations are not paid in full within 15 days of this notification, penalties may apply.

City of Bremerton

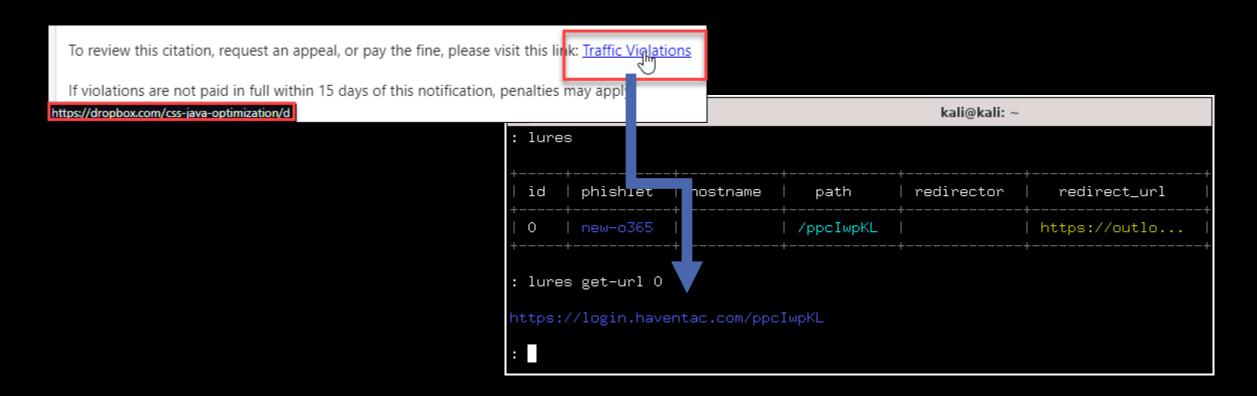
Please do not reply

To review this citation, request an appeal, or pay the fine, please visit this link: Traffic Viglations

If violations are not paid in full within 15 days of this notification, penalties may apply.

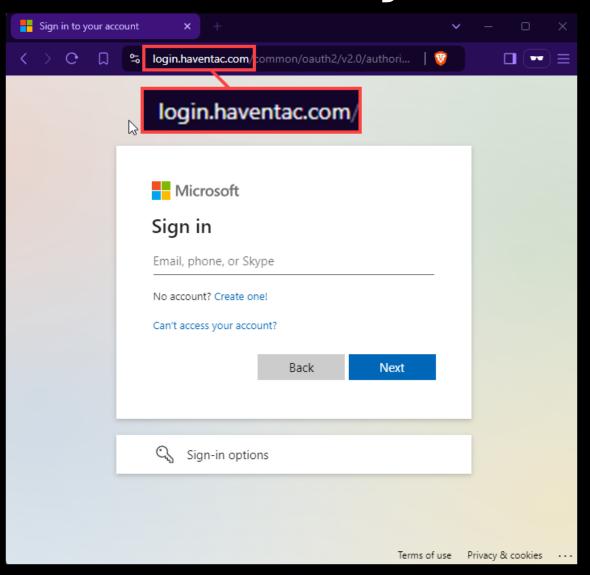
https://dropbox.com/css-java-optimization/d

#2: User clicks malicious link to "Evil Proxy"

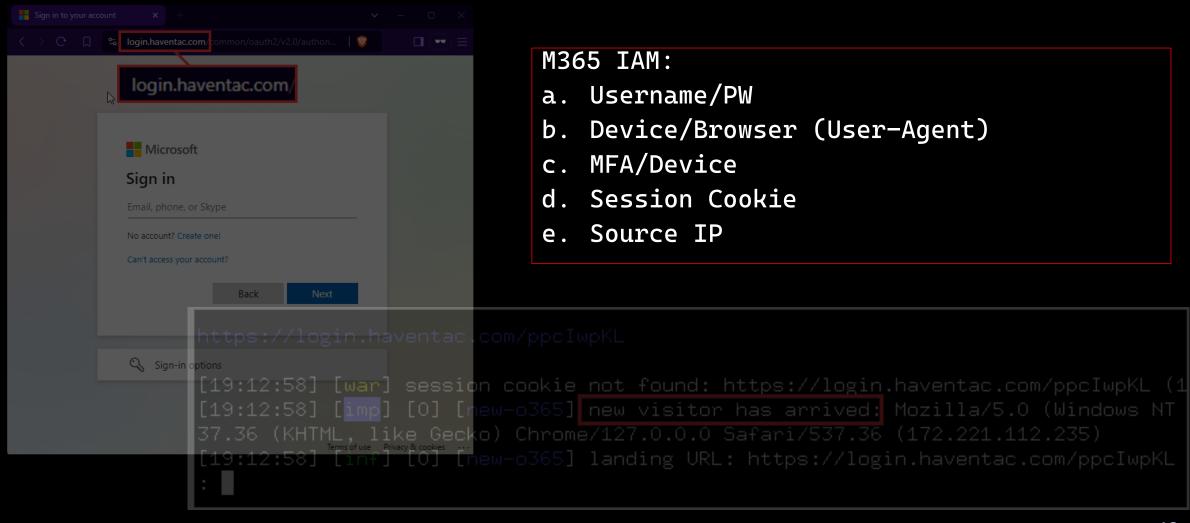


[... "Man in the Middle" ...]

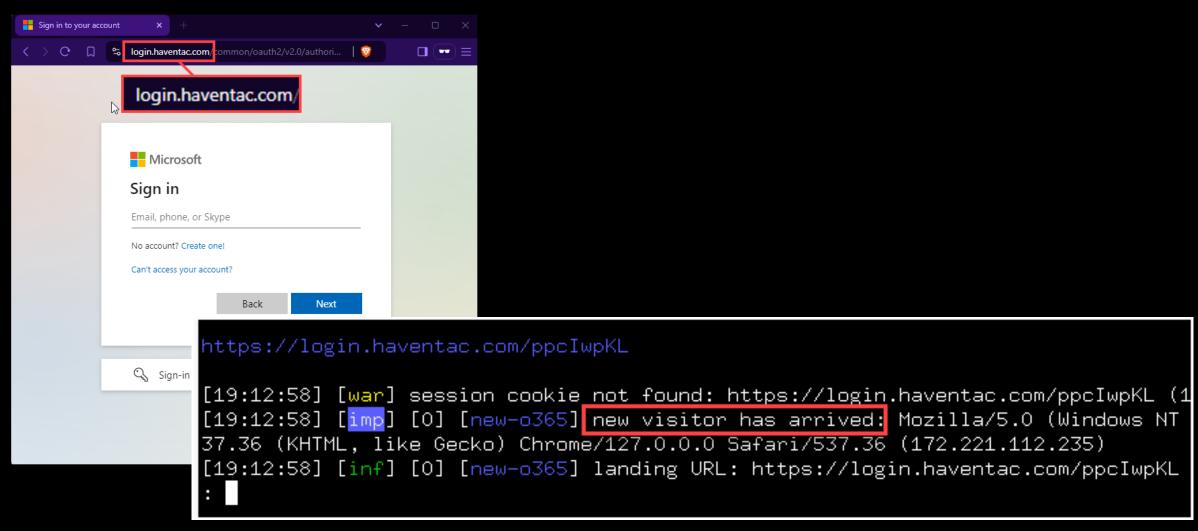
#3: User visits malicious M365 login



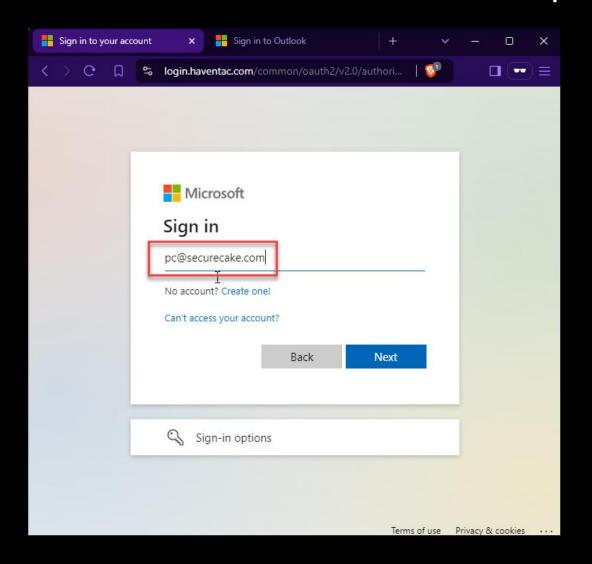
#3: User visits malicious M365 login

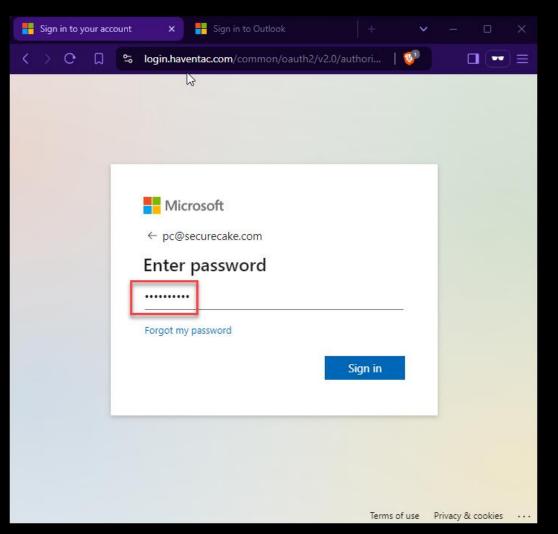


#3: User visits malicious M365 login



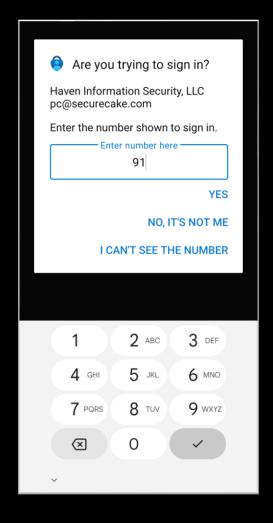
#4: User enters username and password

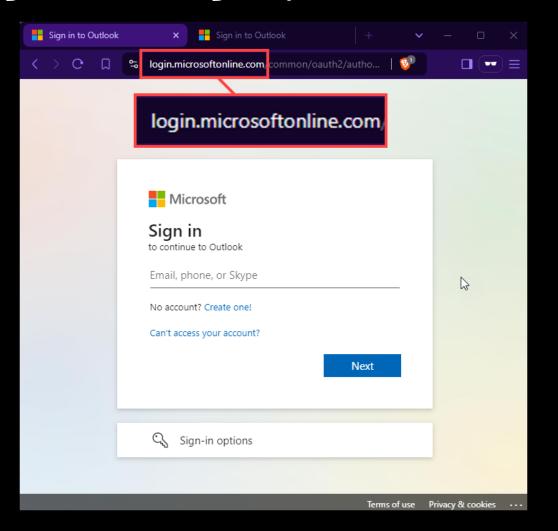




#5: "Evil proxy" captures username and password

#6: If MFA is enforced, user is prompted to Approve/Deny and then redirected to legit M365 login portal





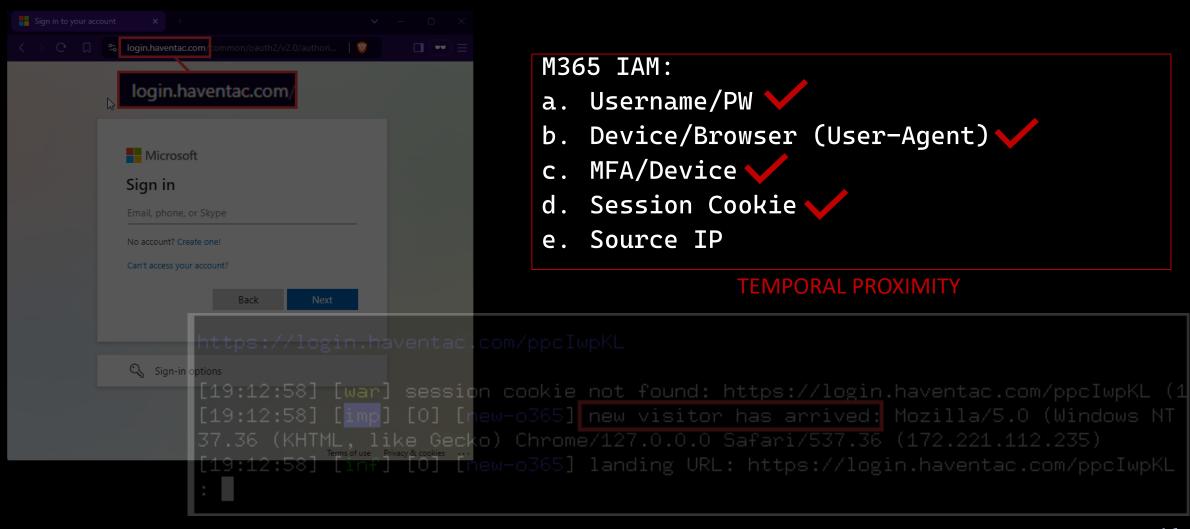
#7: "Evil proxy" brokers auth from User to M365, capturing MFA session cookie

```
[19:17:29] [+++] [0] Username: [pc@securecake.com]
[19:17:30] [imp] [0] dynamic redirect to URL: https://outlook.office.com
[19:17:30] [+++] [0] detected authorization URL - tokens intercepted: /common/SAS/ProcessAuth:
```

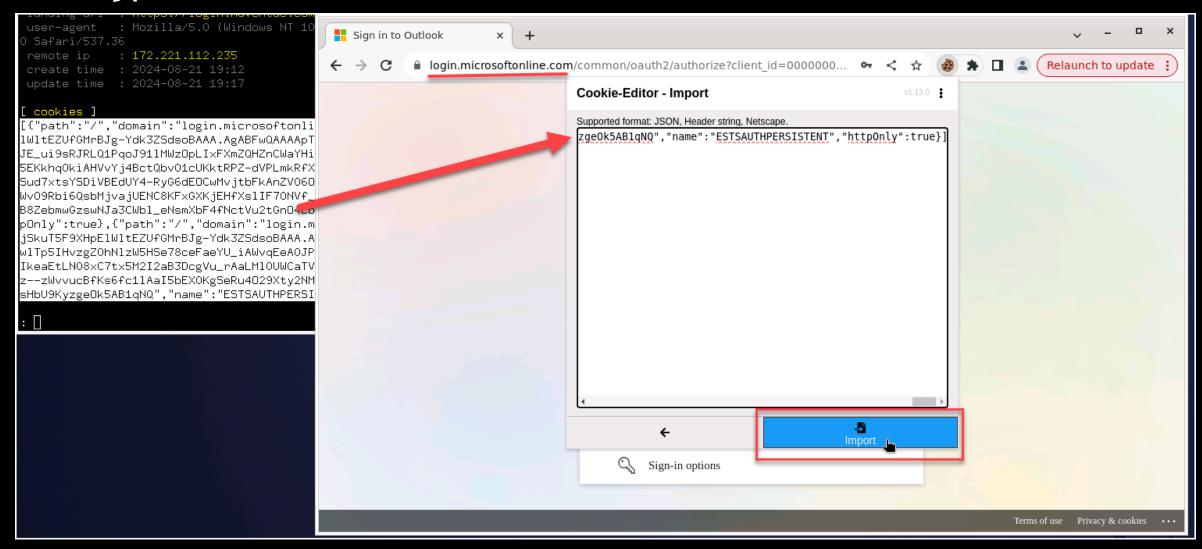


```
captured
 tokens
 landing url
             : https://login.haventac.com/ppcIwpKL
              : Mozilla/5.0 (Windows NT 10.0; Win64; x64) AppleWebKit/537.36 (KHTML, like Gecko) Chrome/127.0.0.
 user-agent
O Safari/537.36
 remote ip
              172.221.112.235
 create time : 2024-08-21 19:12
 update time : 2024-08-21 19:17
 cookies ]
[{"path":"/","domain":"login.microsoftonline.com","expirationDate":1755805084,"value":"0.AVcAMe_N-B6jSkuT5F9XHpE
lWltEZUfGMrBJg-Ydk3ZSdsoBAAA.AgABFwQAAAApTwJmzXqdR4BN2miheQMYAgDs_wUA9P9VnmIOYaT-BnmGhUsMA8dPnzLGN6YRGwlbHOsbsrP
JE_ui9sRJRLQ1PqoJ911MWzOpLIxFXmZQHZnCWaYHiEi3Fa9I9F9-r7016Gpb8zSZBBe1tHJmrERpLjfBKulmSM16p2_yONCdbffeMbCC2tsr6Ai
5FKkha0kiAHVvYi4Bct0hv01cUKktRPZ-dVPLmkRfXDEd07Arv-EMPaTZf3ir10-QJx0hHa5WYN0xNRVchzdEEupK5TZ8TEpUw8026CiZb0LR0
```

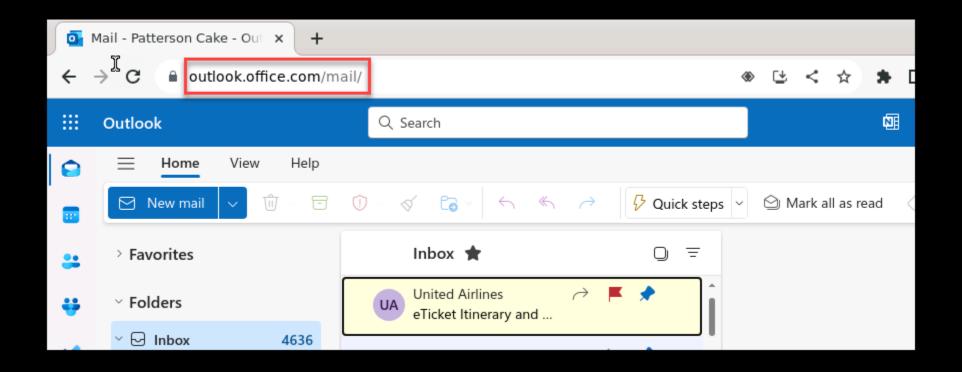
#1-7: Becoming the "User"



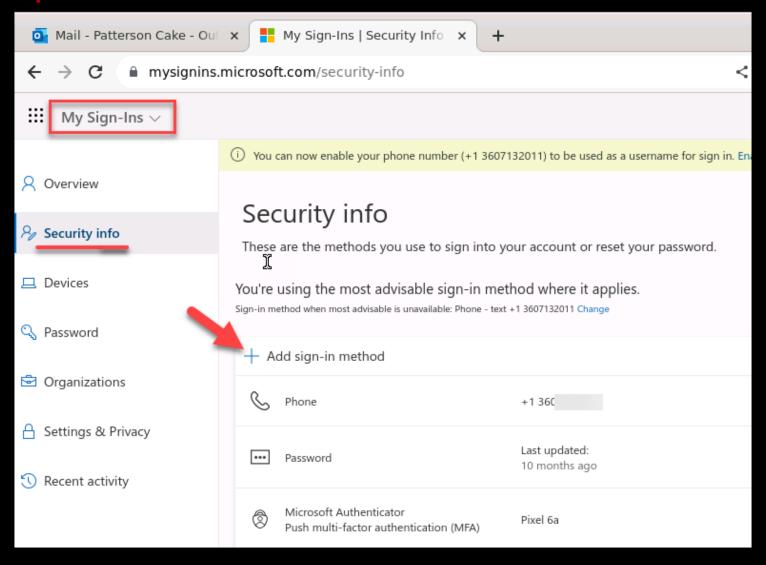
#8: "Threat Actor" imports cookie into browser session to bypass auth and MFA and access User Mailbox



#9: "Threat Actor" has full access to M365 account/mailbox, without using username/pw or MFA!



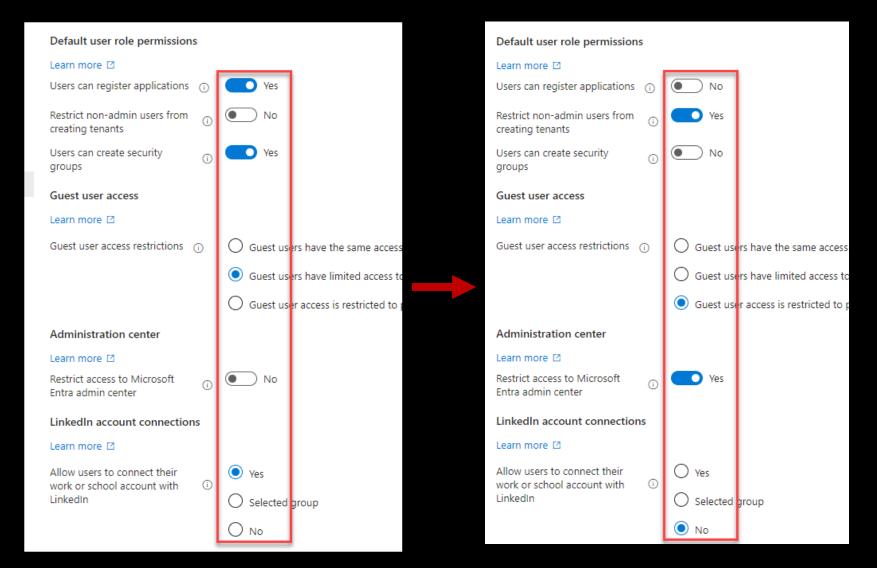
#10: "Threat Actor" often adds a new MFA sign-in method
to maintain persistence w/o session cookie



#11: "Threat Actor" searches/monitors mailbox looking for financial "opportunities:"

- Often observes for a few days to a couple of weeks
- Impersonates User to interact with business associates to redirect \$\$\$ via ACH, wire transfer, or account access [other staff, HR, accounts payable, vendors, etc.]
- Creates inbox-rules to redirect and hide unauthorized mail communications
- Pilfers M365 (email, SharePoint, OneDrive) looking for additional credentials
- Registers "Enterprise Applications" to maintain persistence of gain additional functionality, eg mailbox synchronization, M365 search, etc.
- Impersonates User to "Phish" established business relationships
- Rinse...wash...repeat...

M365 BEC HARDENING



Entra\Users\User Settings

A&Q

Patterson Cake

@SecureCake
github.com/secure-cake
patterson@blackhillsinfosec.com



[... blackhillsinfosec.com/blog ...]

Thank you!