



suspicious events for threat hunter

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Using Sysmon & Event Codes for Threat Hunting

✓ Sysmon

➤ which stands for “ **system monitor** ” is a detection technology rather than a preventative one.

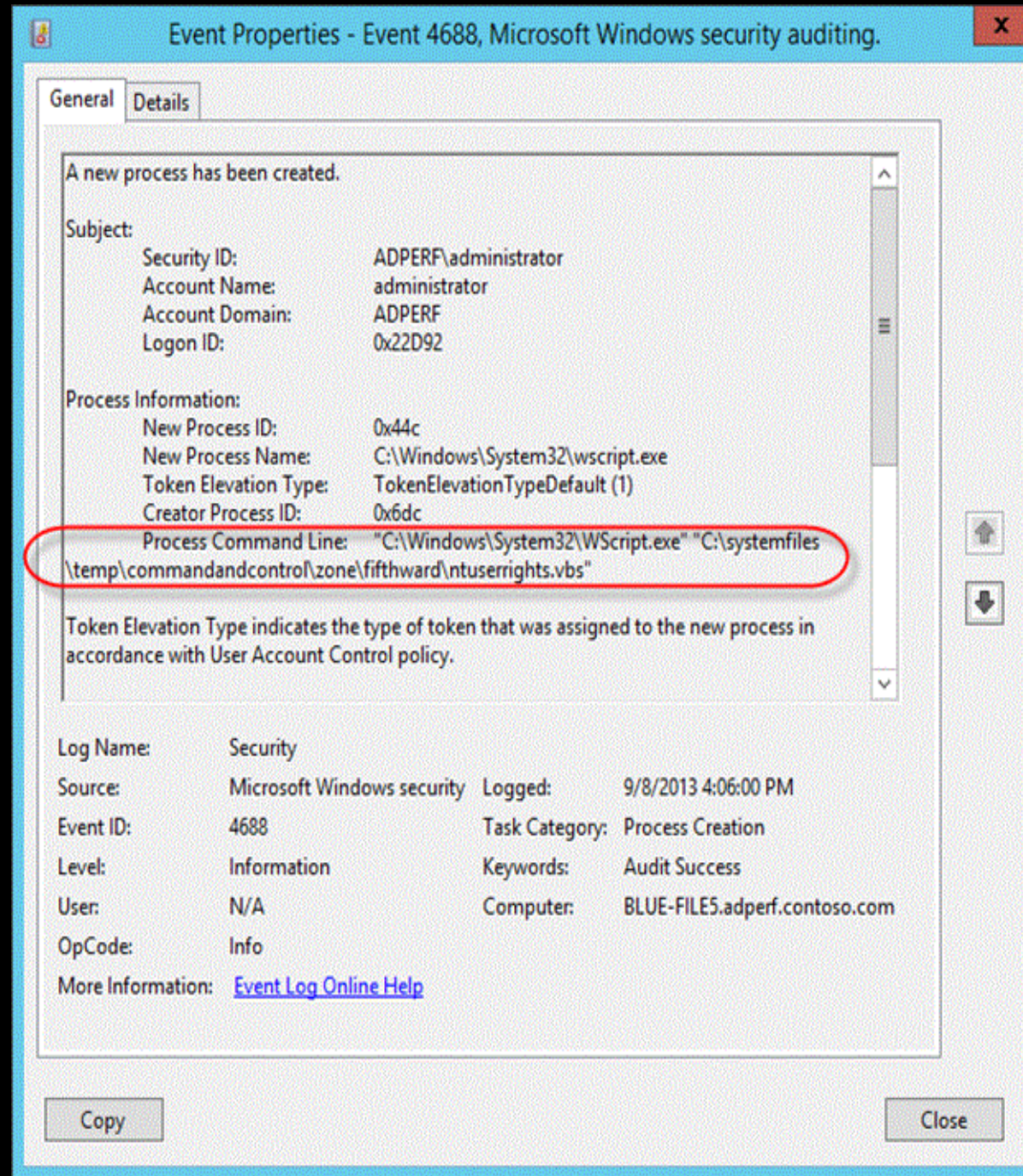
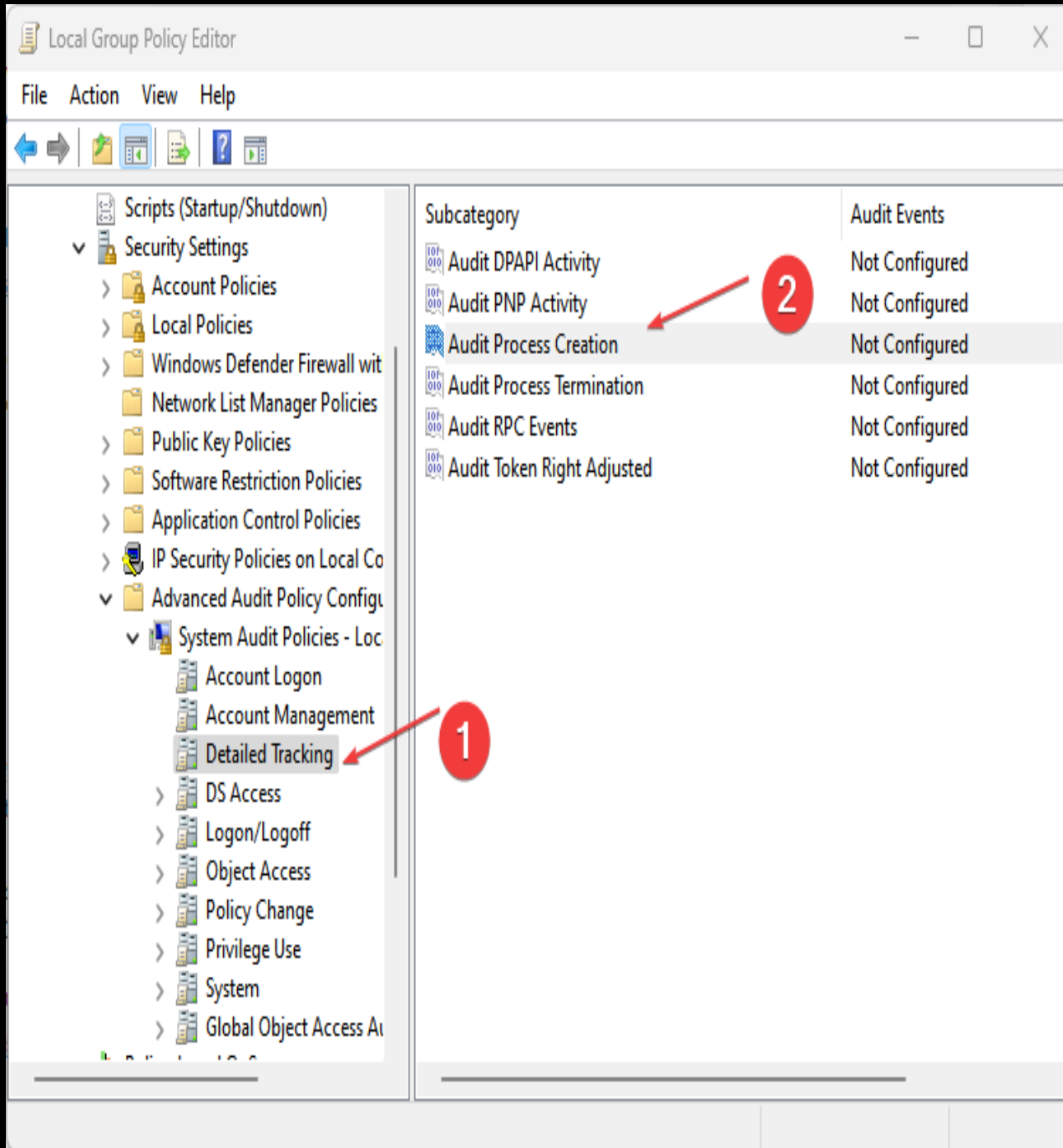
❑ Event Code **4688** (new process)

It's possible that this **is the most significant event code in existence**. Event Code **4688** is defined by Windows as “A new process has been created ” but it can mean much more than that. It is associated with any program or process that a user starts, or even spawns from another process.

freshly formed processes and, if they were produced by a parent process, their Parent Process ID.

❑ Why is this information relevant ?

- The Parent Process ID of a child process is always the same as that of the parent process. This gives you the information you need to remove the infection and aids in locating any malicious processes that may have been spawned.



❑ Splunk query for hunting this event

```
sourcetype="wineventlog:security"EventCode=4688
```

```
| stats count, values(Creator_Process_Name) as Creator_Process_Name by  
New_Process_Name
```

```
| table New_Process_Name, count, Creator_Process_Name
```

```
| sort count
```


New Search

Save As Create Table View Close

```
sourcetype="wineventlog:security" EventCode=4688
| stats count, values(Creator_Process_Name) as Creator_Process_Name by New_Process_Name
| table New_Process_Name, count, Creator_Process_Name
| sort count
```

All time



✓ 1,265,625 events (Partial results for 8/1/16 12:00:00.000 AM to 6/12/23 8:30:59.000 PM) No Event Sampling

Job Job Stop Refresh Download Smart Mode

Events Patterns Statistics (54) Visualization

100 Per Page Format Preview

New_Process_Name	count	Creator_Process_Name
C:\Windows\System32\wbem\WMIADAP.exe	48	C:\Windows\System32\svchost.exe
C:\Windows\System32\sc.exe	50	
C:\Windows\System32\DiskSnapshot.exe	53	C:\Windows\System32\svchost.exe
C:\Windows\System32\SIHClient.exe	66	C:\Windows\System32\svchost.exe
C:\Windows\System32\wuauclt.exe	66	C:\Windows\System32\svchost.exe
C:\Windows\System32\ceipdata.exe	67	
C:\Windows\servicing\TrustedInstaller.exe	69	C:\Windows\System32\services.exe
C:\Windows\WinSxS\amd64_microsoft-windows-servicingstack_31bf3856ad364e35_10.0.10586.486_none_7640e086266ea227\TiWorker.exe	70	C:\Windows\System32\svchost.exe
C:\Windows\System32\wuapihost.exe	72	C:\Windows\System32\svchost.exe
C:\Windows\System32\WerFault.exe	73	
C:\Windows\System32\dmclient.exe	73	C:\Windows\System32\svchost.exe
C:\Windows\SystemApps\Microsoft.LockApp_cw5n1h2txyewy\LockApp.exe	74	C:\Windows\System32\svchost.exe
C:\Program Files (x86)\PHP\v5.5\php-cgi.exe	78	
C:\Program Files\WindowsApps\Microsoft.Messaging_2.15.20002.0_x86__8wekyb3d8bbwe\SkypeHost.exe	79	C:\Windows\System32\svchost.exe
C:\Windows\System32\UsoClient.exe	79	C:\Windows\System32\svchost.exe
C:\Windows\System32\cleanmgr.exe	79	C:\Windows\System32\svchost.exe

❑ Event Code 4738 (User account change)

- Now for my personal favorite, 4738 : "A user account was changed." Every time a user account is modified, this event is recorded, and it is particularly significant when an account is given Administrator rights in a domain or on a stand-alone Windows computer.
- I enjoy searching for this occasion and seeing anything that happens two minutes later. Malicious adversaries, such as hackers or your own staff, frequently try to "elevate" user account permissions.

Keywords	Event ID	Task Category	Date and Time
Event ID: 4738 (4)			
Audit Success	4738	User Account Management	8/27/2020 11:10:45 AM
Audit Success	4738	User Account Management	8/27/2020 11:01:18 AM
Audit Success	4738	User Account Management	8/27/2020 11:10:45 AM
Audit Success	4738	User Account Management	8/27/2020 11:10:45 AM

Event 4738, Microsoft Windows security auditing.

General Details

A user account was changed.

Subject:

Security ID: DESKTOP-TT14AQK\raj
Account Name: raj
Account Domain: DESKTOP-TT14AQK
Logon ID: 0x561CD

Target Account:

Security ID: DESKTOP-TT14AQK\jeenali
Account Name: jeenali
Account Domain: DESKTOP-TT14AQK

Log Name: Security

Source: Microsoft Windows security Logged: 8/27/2020 11:10:45 AM

Event ID: 4738 Task Category: User Account Management

Level: Information Keywords: Audit Success

User: N/A Computer: DESKTOP-TT14AQK

OpCode: Info

More Information: [Event Log Online Help](#)

Event Properties - Event 4738, Microsoft Windows security auditing.

General Details

A user account was changed.

Subject:

Security ID: TESTLAB\dfm.a
Account Name: dfm.a
Account Domain: TESTLAB
Logon ID: 0x5E915

Target Account:

Security ID: TESTLAB\victim
Account Name: victim
Account Domain: TESTLAB

Changed Attributes:

SAM Account Name: -
Display Name: -

Log Name: Security

Source: Microsoft Windows security

Logged: 6/16/2017 3:51:42 PM

Event ID: 4738

Task Category: User Account Management

Level: Information

Keywords: Audit Success

User: N/A

Computer: PRIMARY.testlab.local

OpCode: Info

More Information: [Event Log Online Help](#)

Copy

Close

❑ Splunk query for hunting this event

index=wineventlog

[search index=wineventlog sourcetype=WinEventLog* EventCode=4738

| eval earliest=_time-120

| eval latest=_time+120

| fields host, earliest, latest]

| table host, sourcetype, EventCode, Message

```
index=wineventlog
[search index=wineventlog sourcetype=WinEventLog* EventCode=4738
| eval earliest=_time-120
| eval latest=_time+120
| fields host,earliest, latest]
| table host, sourcetype, EventCode, Message
```

Last 24 hours ▾



✓ 13 events (6/14/23 9:44:05.000 AM to 6/14/23 9:48:05.000 AM) No Event Sampling ▾

Job ▾ || ■ → 🖨️ ⬇️ ! Smart Mode ▾

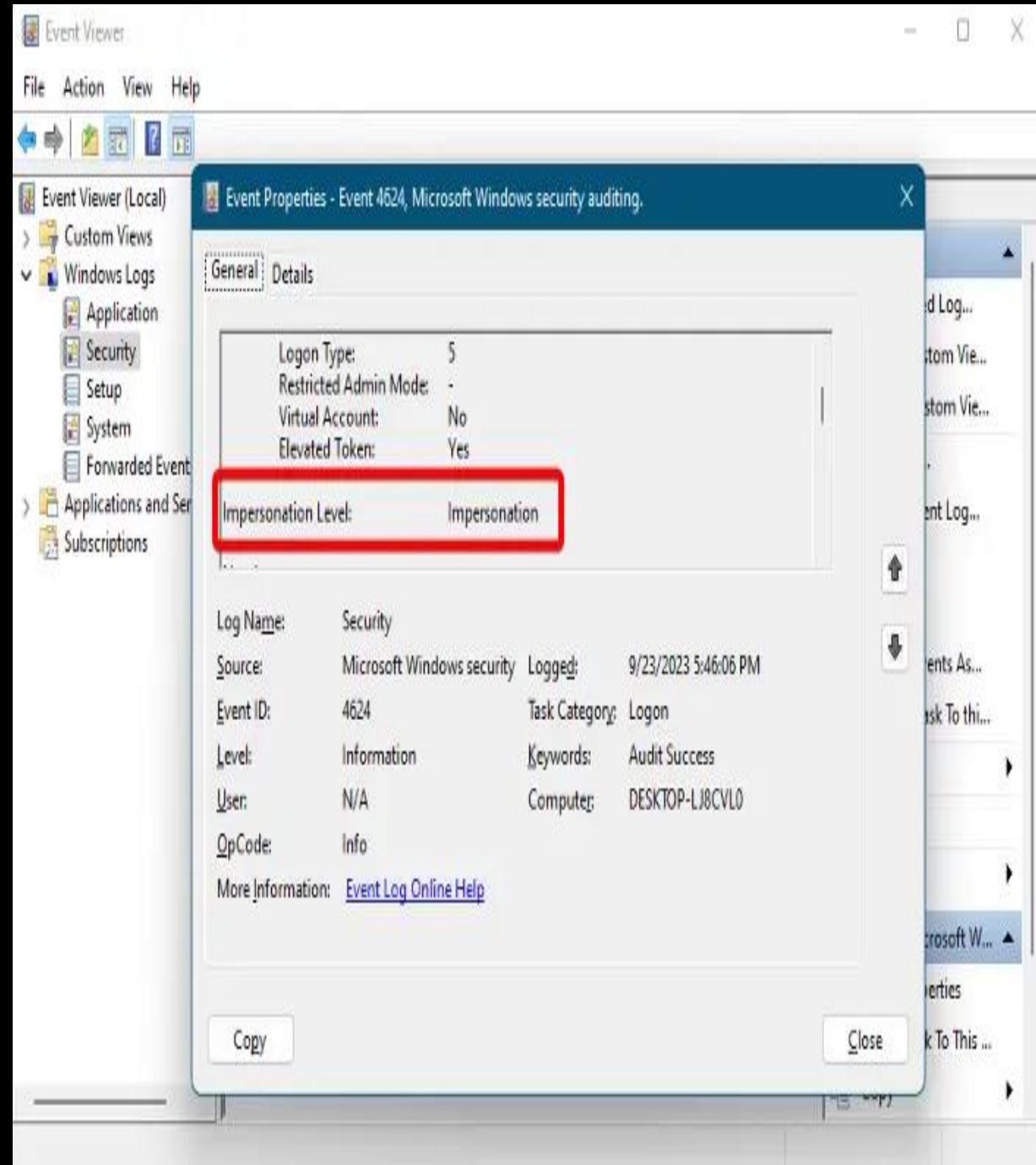
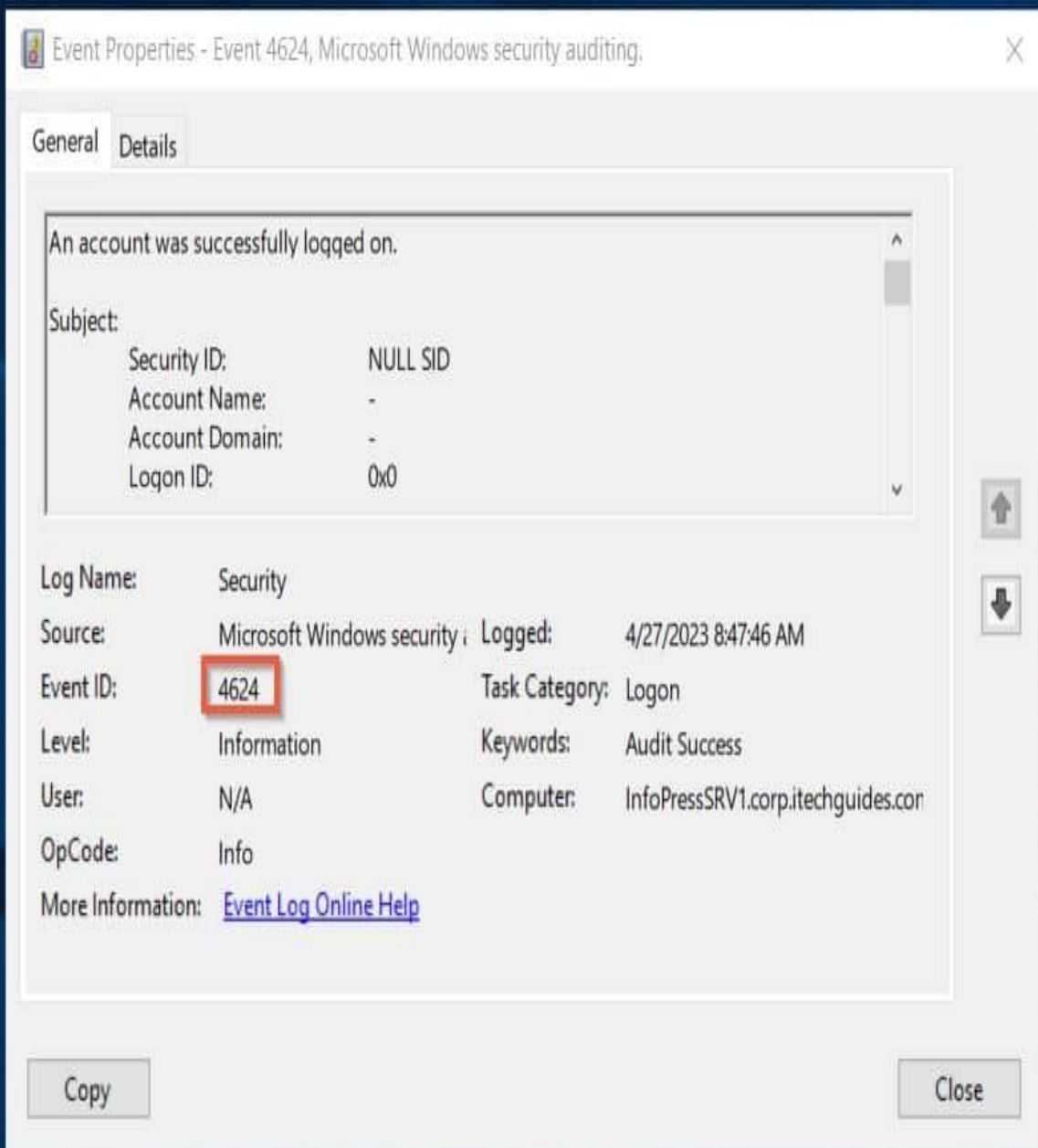
Events Patterns **Statistics (13)** Visualization

20 Per Page ▾ ✎ Format Preview ▾

host ↕ ✎	sourcetype ↕ ✎	EventCode↕	Message ↕
IP-C0912123	WinEventLog:Setup	2	Package KB5005292 was successfully changed to the installed state.
IP-C0912123	WinEventLog:Setup	2	Package KB5024231 was successfully changed to the installed state.
IP-C0912123	WinEventLog:Setup	2	Package KB5024364 was successfully changed to the installed state.
IP-C0912123	WinEventLog:Setup	4	A reboot is necessary before package KB5024231 can be changed to installed state.
IP-C0912123	WinEventLog:Setup	3	Package KB5024231 failed to be changed to the Staged state. Status: 0x800f0816
IP-C0912123	WinEventLog:Setup	4689	A process has exited. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 Process Information: Process ID: 0x1fb4 Process Name: C:\Windows\System32\net1.exe Exit
IP-C0912123	WinEventLog:Setup	4689	A process has exited. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 Process Information: Process ID: 0x1fb4 Process Name: C:\Windows\System32\net1.exe Exit
IP-C0912123	WinEventLog:Setup	4732	A member was added to a security-enabled local group. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 Member: Security ID: MADS-M\mmpm Account Name: - Group:
IP-C0912123	WinEventLog:Setup	4724	An attempt was made to reset an account's password. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 Target Account: Security ID: MADS-M\mmpm Account Name: mmp
IP-C0912123	WinEventLog:Setup	4738	A user account was changed. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 Target Account: Security ID: MADS-M\mmpm Account Name: mmpm Account Domain: MADS-
IP-C0912123	WinEventLog:Setup	4722	A user account was enabled. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 Target Account: Security ID: MADS-M\mmpm Account Name: mmpm Account Domain: MADS-
IP-C0912123	WinEventLog:Setup	4628	A member was added to a security-enabled global group. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 Member: Security ID: MADS-M\mmpm Account Name: - Group
IP-C0912123	WinEventLog:Setup	4720	A user account was created. Subject: Security ID: AzureAD\MadsSakulim Account Name: MadsSakulim Account Domain: AzureAD Logon ID: 0x1052C75 New Account: Security ID: MADS-M\mmpm Account Name: mmpm Account Domain: MADS-M A

❏ Event Code 4624 (Successful login)

- When an account logs into a Windows environment successfully, Event Code 4624 is generated. By using this data, a user baseline of login times and locations can be established.
- Additionally, Event Code 4624 logs the various logon types, such as network and local. You can use this data to identify outliers in your network filtering by logon type or even time



❑ Splunk query for hunting this event

```
sourcetype="wineventlog:security" EventCode=4624  
  
| eventstats avg("_time") as avg stdev("_time") as stdev  
  
| eval lowerBound=(avg-stdev*exact(2)),  
upperBound=(avg+stdev*exact(2))  
  
| eval isOutlier=if('_time' < lowerBound OR '_time' > upperBound, 1, 0)  
  
| table _time, isOutlier, body
```

New Search

Save As>Create Table ViewClose

sourcetype="wineventlog:security" EventCode=4624

| eventstats avg("_time") as avg stdev("_time") as stdev

| eval lowerBound=(avg-stdev*exact(2)), upperBound=(avg+stdev*exact(2))

| eval isOutlier=if('_time' < lowerBound OR '_time' > upperBound, 1, 0)

| table _time, isOutlier, body

All time

✓ 579,580 events (8/1/16 12:00:00.000 AM to 6/12/23 8:58:21.000 PM) No Event Sampling

JobPauseDownloadSmart Mode

EventsPatternsStatistics (579,580)Visualization

100 Per PageFormatPreview

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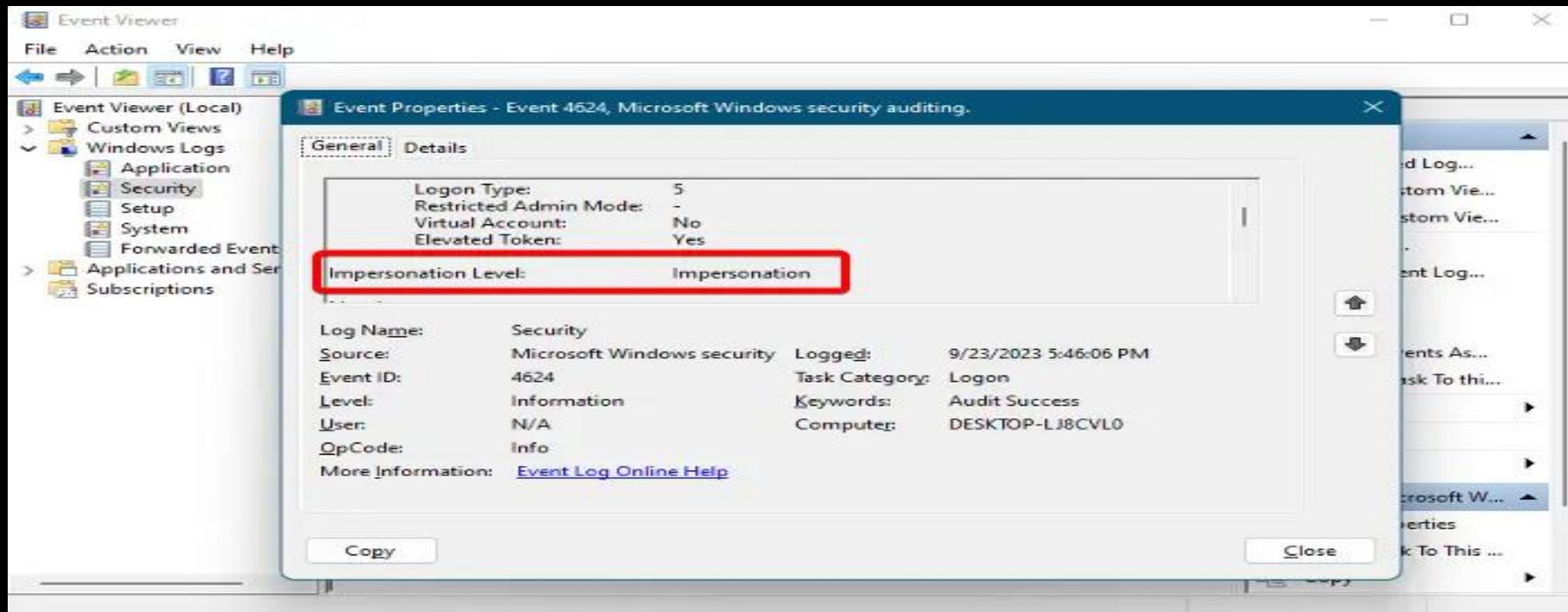
...

Next >

_time	isOutlier	body
2016-08-28 18:58:32	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we6573srv\$ A
2016-08-28 12:42:01	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we5989srv
2016-08-28 17:24:00	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we9385srv\$ A
2016-08-28 18:31:36	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: WAYNECORPINC\we6925srv\$ Account Name: we6925sr
2016-08-28 12:00:18	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we2288srv
2016-08-28 15:08:09	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we9857srv
2016-08-28 22:34:25	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: WAYNECORPINC\we5165srv\$ Account Name: we5165sr
2016-08-28 10:17:51	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we8919srv\$ A
2016-08-28 17:30:49	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we9688srv
2016-08-28 10:27:51	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we9730srv
2016-08-28 17:22:49	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we4693srv
2016-08-28 21:23:23	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we5193srv\$ A
2016-08-28 22:51:57	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: WAYNECORPINC\we2989srv\$ Account Name: we2989sr
2016-08-28 20:01:35	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we7148srv
2016-08-28 19:00:05	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we1499srv\$ A
2016-08-28 18:19:59	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we1936srv
2016-08-28 23:07:48	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Delegation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we4368srv\$ A
2016-08-28 18:47:55	0	An account was successfully logged on. Subject: Security ID: NULL SID Account Name: - Account Domain: - Logon ID: 0x0 Logon Type: 3 Impersonation Level: Impersonation New Logon: Security ID: NT AUTHORITY\SYSTEM Account Name: we9508srv

❑ Event Code 1102 (Audit log clearing)

➤ When a Windows administrator or administrative account clears the audit log, Event Code 1102 is triggered. It should not be used frequently, and if it is, it may be done to hide something.



❑ Splunk query for hunting this event

```
(`wineventlog_security` EventCode=1102) OR (`wineventlog_system`  
EventCode=104)
```

```
| stats count min(_time) as firstTime max(_time) as lastTime by dest name  
EventCode
```

```
| `security_content_ctime(firstTime)`
```


```
| `security_content_ctime(lastTime)`
```

```
| `windows_event_log_cleared_filter`
```


New Search

Save As ▾ New Table Close

```
1 index=botsv2 OR index=botsv1 sourcetype=wineventlog EventCode=1102 OR (EventCode=4688 wevtutil.exe cl)
2 | bucket _time span=1d
3 | stats count by _time user ComputerName EventCode
```

All time ▾ 

✓ 485 events (before 06/03/2020 13:00:10.000) No Event Sampling ▾ Job ▾ || ■ ↗ 🖨 ⬇️ 🗨 Verbose Mode ▾

Events (485) Patterns Statistics (2) Visualization

20 Per Page ▾ / Format Preview ▾

_time ⚙	user ⚙	ComputerName ⚙	EventCode ⚙	count ⚙
2017-08-26	service3	wrk-klagerf.frothly.local	1102	1
2017-08-26	service3	wrk-klagerf.frothly.local	4688	484

❑ Event Code 4720 user account created

➤ An event log with ID 4720 will be present on a Windows workstation upon the creation of a new user account. Considering that most accounts are created via Active Directory, this can be a sign of a persistent attempt.

The screenshot shows the Windows Event Viewer interface. The left pane displays the 'Security' log under 'Windows Logs'. The right pane shows a list of events, with Event 4720 selected. Below the list, the details for Event 4720 are displayed, including the subject (Administrator) and the new account (u3).

Keywords	Date and Time	Source	Event ID	Task C...
Audit Success	7/11/2022 4:50:01 PM	Micros...	4724	User A...
Audit Success	7/11/2022 4:50:01 PM	Micros...	4738	User A...
Audit Success	7/11/2022 4:50:01 PM	Micros...	4672	Special...
Audit Success	7/11/2022 4:50:01 PM	Micros...	4769	Kerber...
Audit Success	7/11/2022 4:50:01 PM	Micros...	4768	Kerber...
Audit Success	7/11/2022 4:50:01 PM	Micros...	4720	User A...
Audit Success	7/11/2022 4:49:44 PM	Micros...	4634	Logoff
Audit Success	7/11/2022 4:49:44 PM	Micros...	4624	Logon
Audit Success	7/11/2022 4:49:44 PM	Micros...	4672	Special...
Audit Success	7/11/2022 4:49:18 PM	Micros...	4634	Logoff

Event 4720, Microsoft Windows security auditing.

General Details

A user account was created.

Subject:

- Security ID: A\Administrator
- Account Name: Administrator
- Account Domain: A
- Logon ID: 0x18A4FDF

New Account:

- Security ID: A\u3
- Account Name: u3
- Account Domain: A

Attributes:

- SAM Account Name: u3
- Display Name: u3
- User Principal Name: u3@a.com
- Home Directory: -
- Home Drive: -

Log Name: Security

Source: Microsoft Windows security

Event ID: 4720

Level: Information

User: N/A

OpCode: Info

More Information: [Event Log Online Help](#)

Logged: 7/11/2022 4:50:01 PM

Task Category: User Account Management

Keywords: Audit Success

Computer: vchzho81VM.a.com

❑ Splunk query for hunting this event

```
index=* source="WinEventLog:Security" (EventCode=4720 OR  
EventCode=624)
```

```
| eval CreatedBy = mvindex(Account_Name,0)
```

```
| eval New_User = mvindex(Account_Name,1)
```

```
| search CreatedBy=*
```

```
| table _time EventCode CreatedBy New_User
```

1 index=main EventID=4720

All time ▾



✓ 1 event (before 10/15/23 10:29:57.000 PM) No Event Sampling ▾

Job ▾



Smart Mode ▾

Events (1)

Patterns

Statistics

Visualization

Format Timeline ▾

— Zoom Out

+ Zoom to Selection

× Deselect

1 millisecond per column

List ▾

/ Format

20 Per Page ▾

< Hide Fields

≡ All Fields

SELECTED FIELDS

a host 1

a source 1

a sourcetype 1



Time

Event



5/11/22

10:32:18.000 PM

{ [-]

@version: 1

AccountExpires: %%1794

ActivityID: {E0F7BC1B-4488-0000-8D57-1F92808AD601}

AllowedToDelegateTo: -

❑ Event Code **4798** (The user's local group membership was analyzed).

- The membership of a user in local groups was listed: When a process lists all the local groups that the specified user is a member of on that computer, Windows records this event.
- This event is important to identify and apprehend so-called **APT** actors that are extending their horizontal kill chain by investigating the local accounts on a compromised system.

Keywords	Event ID	Task Category	Date and Time
Event ID: 4798 (5)			
Audit Success	4798	User Account Management	8/27/2020 11:01:18 AM
Audit Success	4798	User Account Management	8/27/2020 11:10:45 AM
Audit Success	4798	User Account Management	8/27/2020 11:10:45 AM
Audit Success	4798	User Account Management	8/27/2020 11:10:45 AM
Audit Success	4798	User Account Management	8/27/2020 11:10:45 AM

Event 4798, Microsoft Windows security auditing.

General Details

A user's local group membership was enumerated.

Subject:

Security ID: DESKTOP-TT14AQK\raj
Account Name: raj
Account Domain: DESKTOP-TT14AQK
Logon ID: 0x561CD

User:

Security ID: DESKTOP-TT14AQK\jeenali
Account Name: jeenali
Account Domain: DESKTOP-TT14AQK

Log Name: Security

Source: Microsoft Windows security Logged: 8/27/2020 11:01:18 AM

Event ID: 4798 Task Category: User Account Management

Level: Information Keywords: Audit Success

User: N/A Computer: DESKTOP-TT14AQK

OpCode: Info

More Information: [Event Log Online Help](#)

General Details

A user's local group membership was enumerated.

Subject:

Security ID: CONTOSO\dadmin
Account Name: dadmin
Account Domain: CONTOSO
Logon ID: 0x72D9D

User:

Security ID: WIN10-1\Administrator
Account Name: Administrator
Account Domain: WIN10-1

Process Information:

Process ID: 0xc80
Process Name: C:\Windows\System32\mmc.exe

Log Name: Security

Source: Microsoft Windows security Logged: 11/11/2015 8:14:17 PM

Event ID: 4798 Task Category: User Account Management

Level: Information Keywords: Audit Success

User: N/A Computer: WIN10-1.contoso.local

OpCode: Info

More Information: [Event Log Online Help](#)

Copy

Close



**THANK
YOU**

The image features a hand in a dark suit sleeve hovering just above a glowing blue circular interface. The interface has a segmented outer ring and is surrounded by various digital elements like lines, dots, and small rectangular patterns. The background is a solid dark blue.