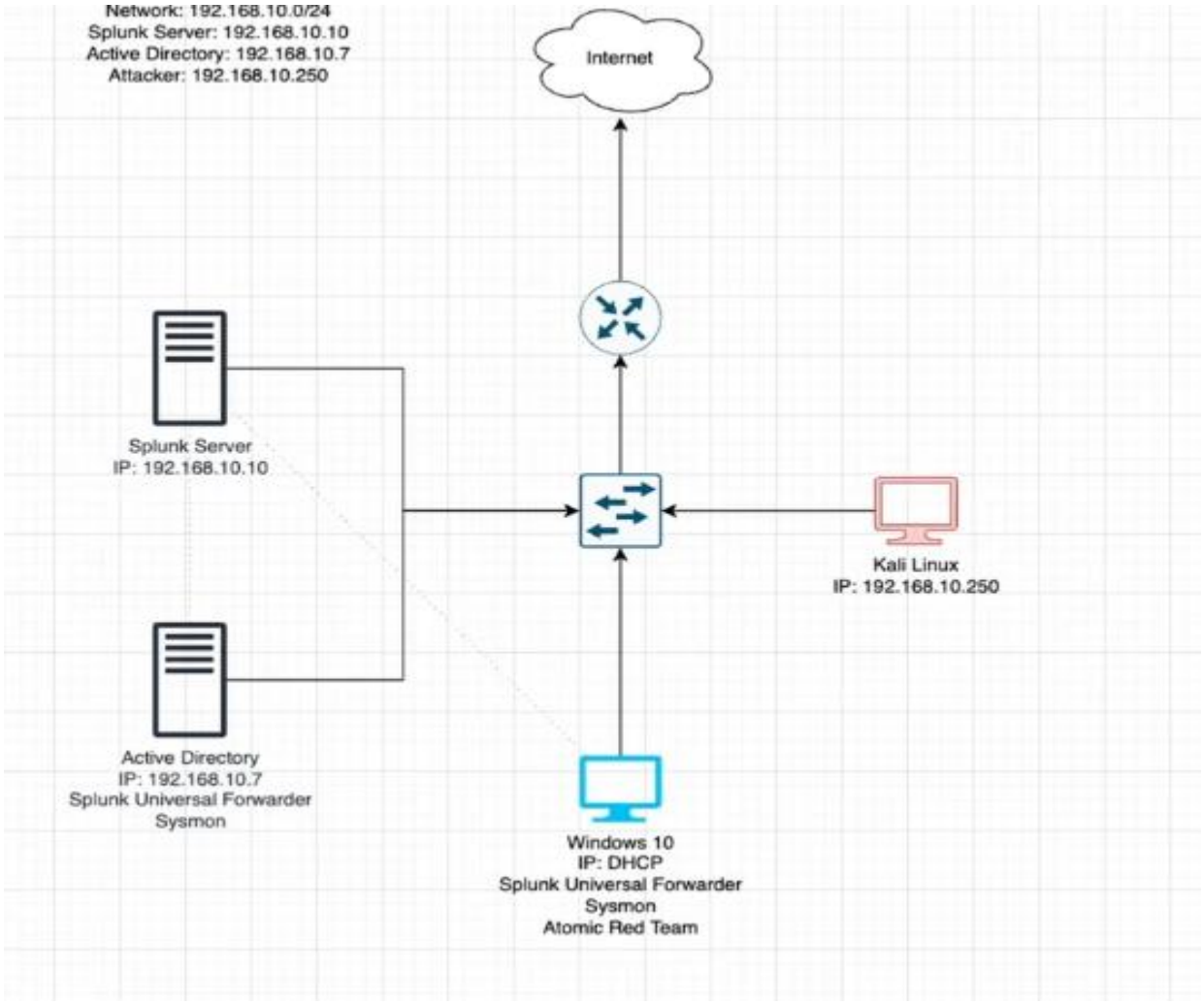
Active Directory Project

The lab environment consisted of Windows Server configured as a Domain Controller, multiple Windows client machines joined to the domain, Splunk for centralized log monitoring, and Kali Linux for security testing and attack simulation.

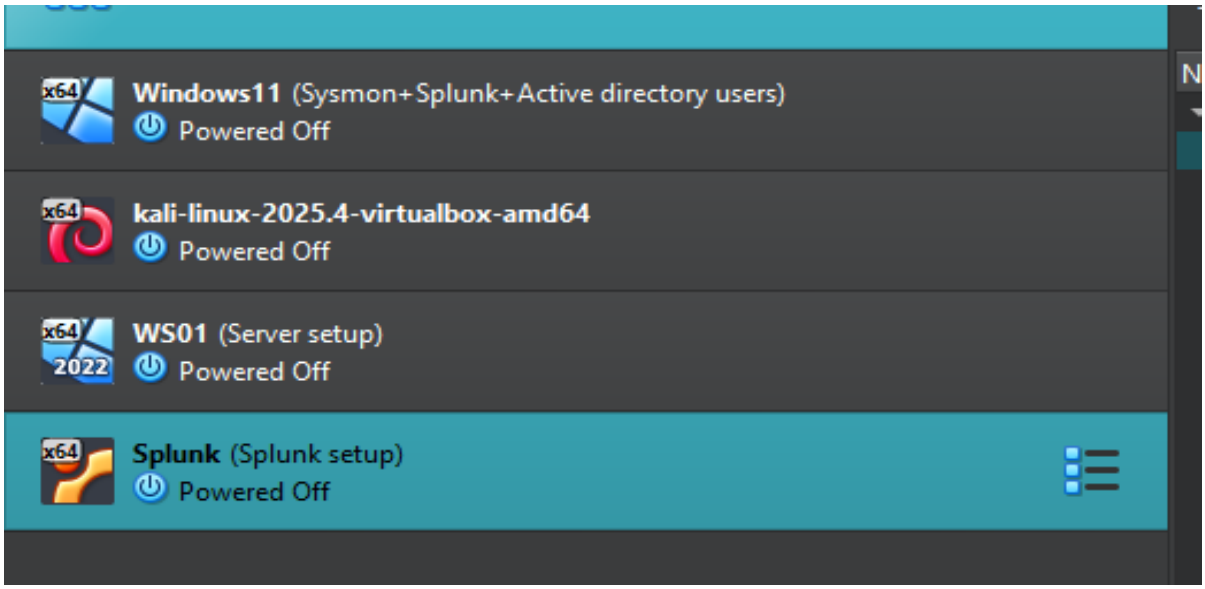
Active Directory was used to manage users, groups, and Group Policy Objects (GPOs). User accounts were created with different privilege levels to simulate real organizational roles. Security policies such as password complexity, account lockout policies, and access control rules were enforced through GPOs.

Splunk was integrated to collect and analyze Windows event logs, including authentication attempts, account changes, and security alerts. This enabled real-time monitoring and detection of suspicious activity such as failed login attempts and privilege escalation events.

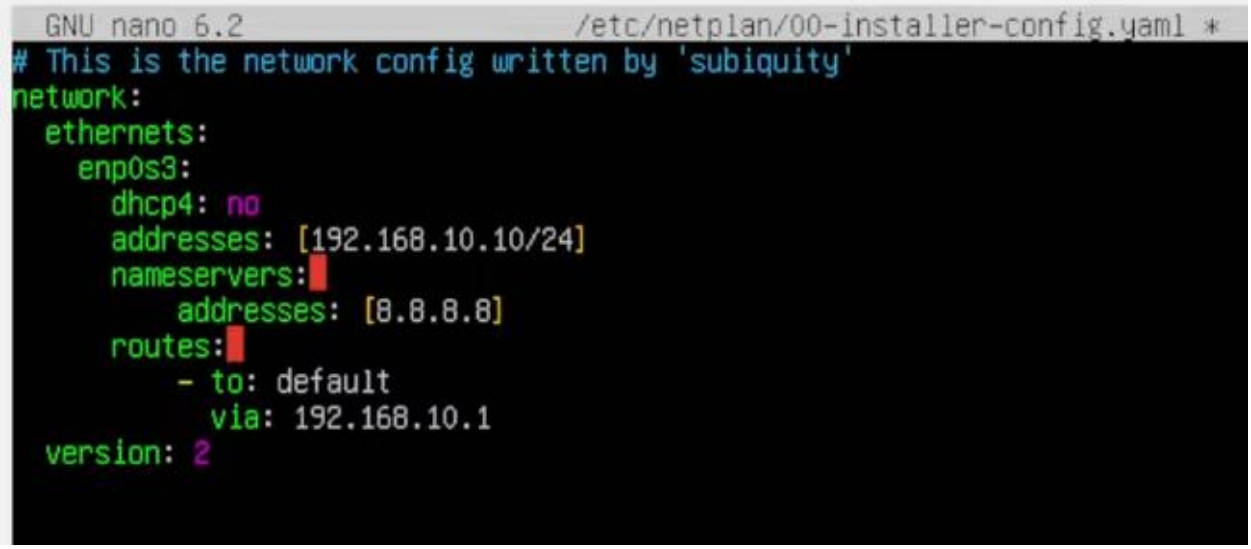


Active Directory setup

Kali Linux was used to perform penetration testing techniques against the domain, including password attacks and enumeration, to evaluate the effectiveness of implemented security controls.

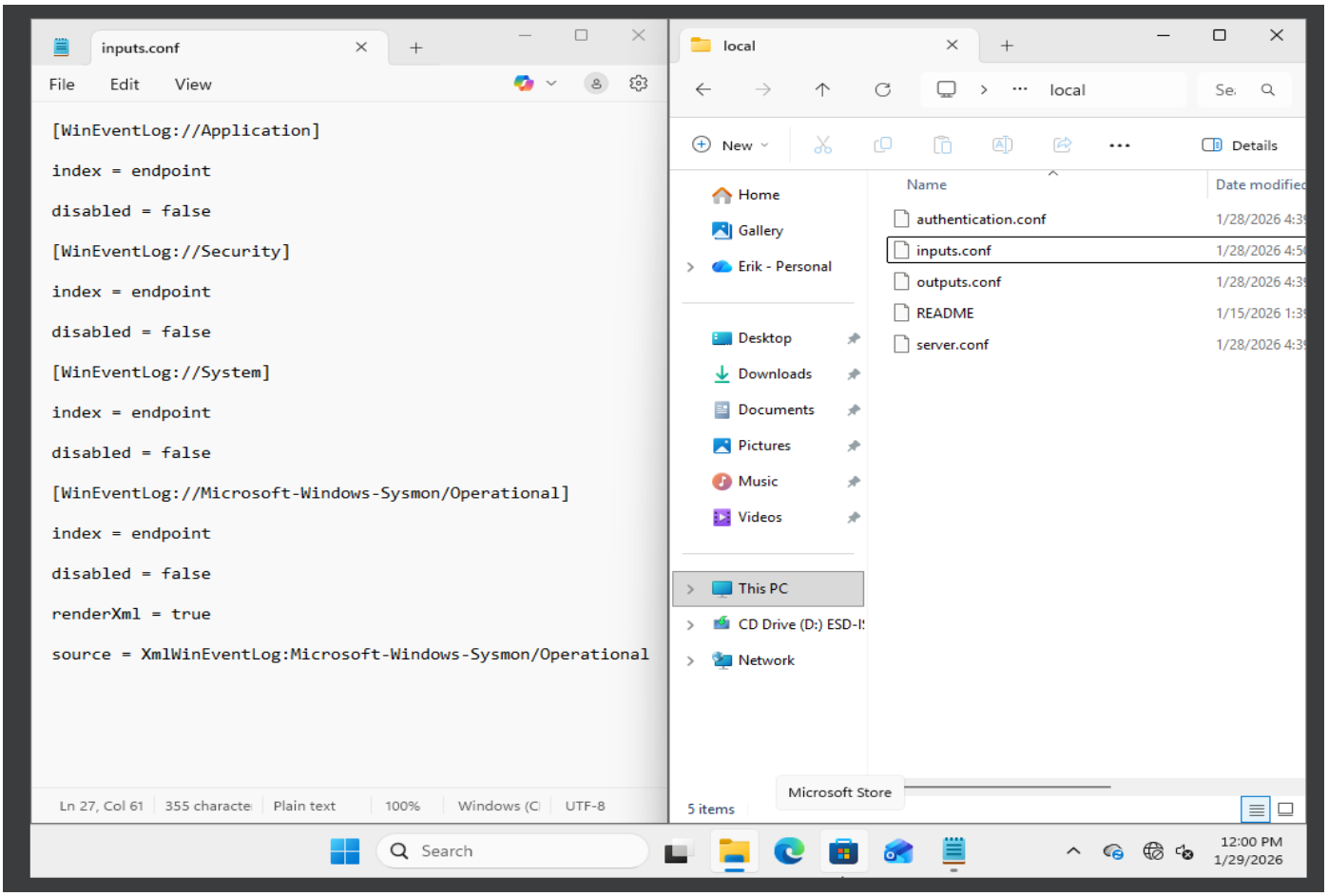


Virtual machines setup with snapshots

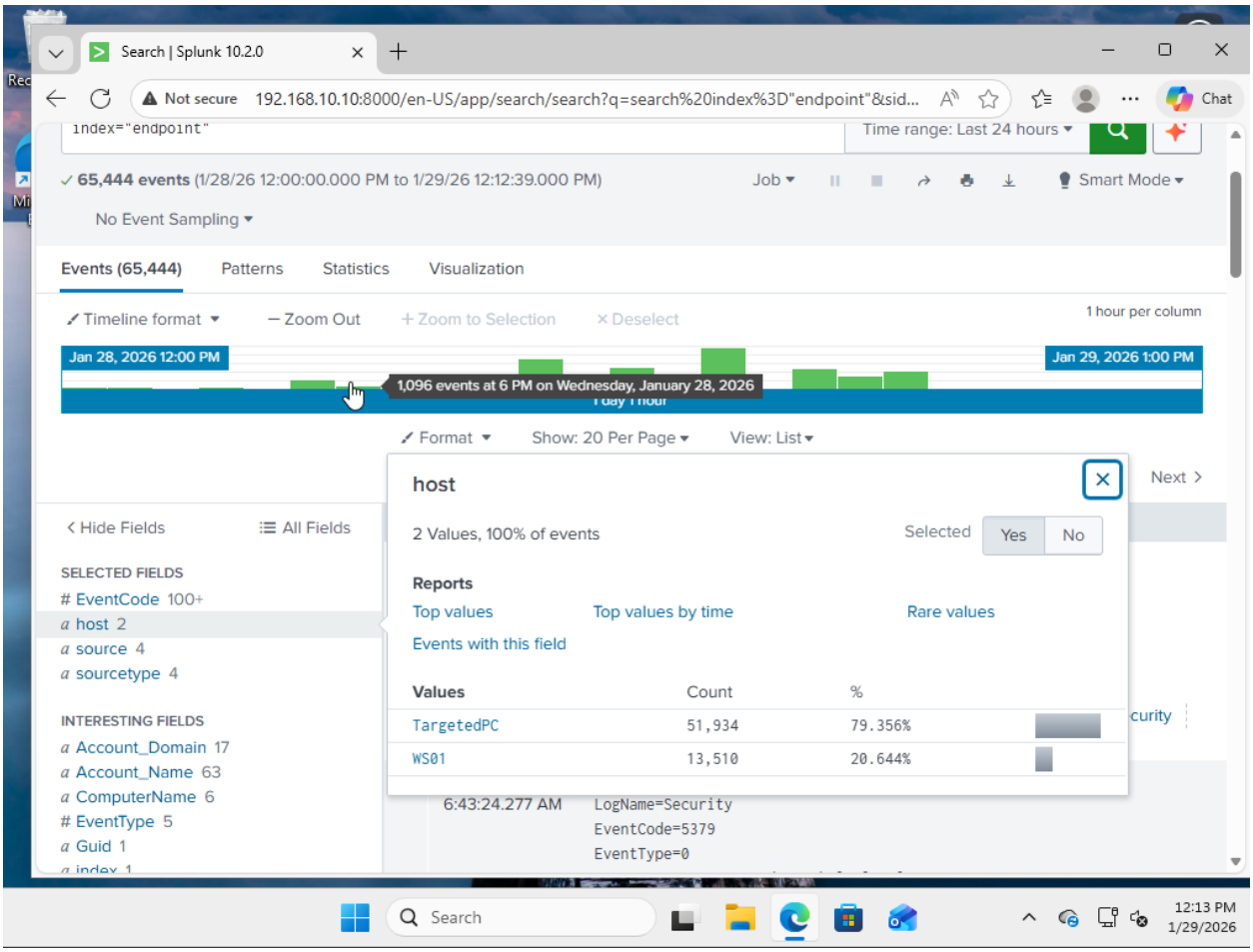


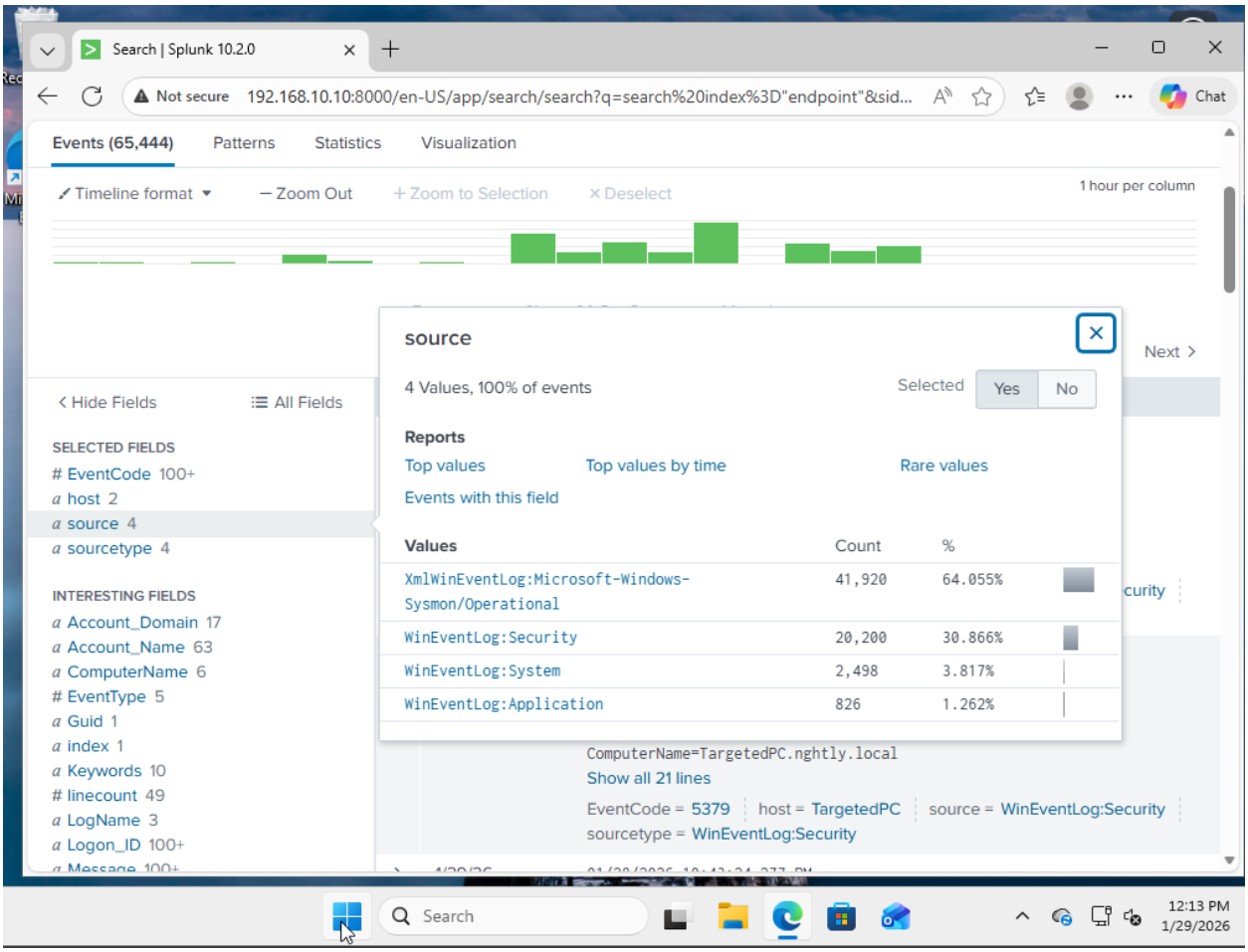
The image shows the Netplan network configuration used to assign a static IP address to the Splunk server in the lab environment.

Splunk was configured with a static IP address (`192.168.10.10/24`) to ensure consistent and reliable connectivity with other systems, such as the Windows Server Domain Controller and Windows client machines. DHCP was disabled to prevent IP address changes that could disrupt log forwarding.



Splunk Universal Forwarder setup with an inputs.conf(For the targeted machine and the windows server) to define which logs or data sources should be monitored, specify where the logs are located (files, Windows Event Logs, directories, etc.) Control how often data is read, decide what data gets sent to Splunk.


Search | Splunk 10.2.0
Not secure 192.168.10.10:8000/en-US/app/search/search?q=search%20index%3D"endpoint"&sid...
Chat
index="endpoint"
Time range: Last 24 hours
65,444 events (1/28/26 12:00:00.000 PM to 1/29/26 12:12:39.000 PM)
Job
Smart Mode
No Event Sampling
Events (65,444)
Patterns
Statistics
Visualization
Timeline format
Zoom Out
Zoom to Selection
Deselect
1 hour per column
Jan 28, 2026 12:00 PM
1,096 events at 6 PM on Wednesday, January 28, 2026
Jan 29, 2026 1:00 PM
Format
Show: 20 Per Page
View: List
Next
Hide Fields
All Fields
SELECTED FIELDS
EventCode 100+
a host 2
a source 4
a sourcetype 4
INTERESTING FIELDS
a Account_Domain 17
a Account_Name 63
a ComputerName 6
EventType 5
a Guid 1
host
2 Values, 100% of events
Selected
Yes
No
Reports
Top values
Top values by time
Rare values
Events with this field
Values
Count
%
TargetedPC
51,934
79.356%
WS01
13,510
20.644%
curity
6:43:24.277 AM
LogName=Security
EventCode=5379
EventType=0
Search
12:13 PM
1/29/2026

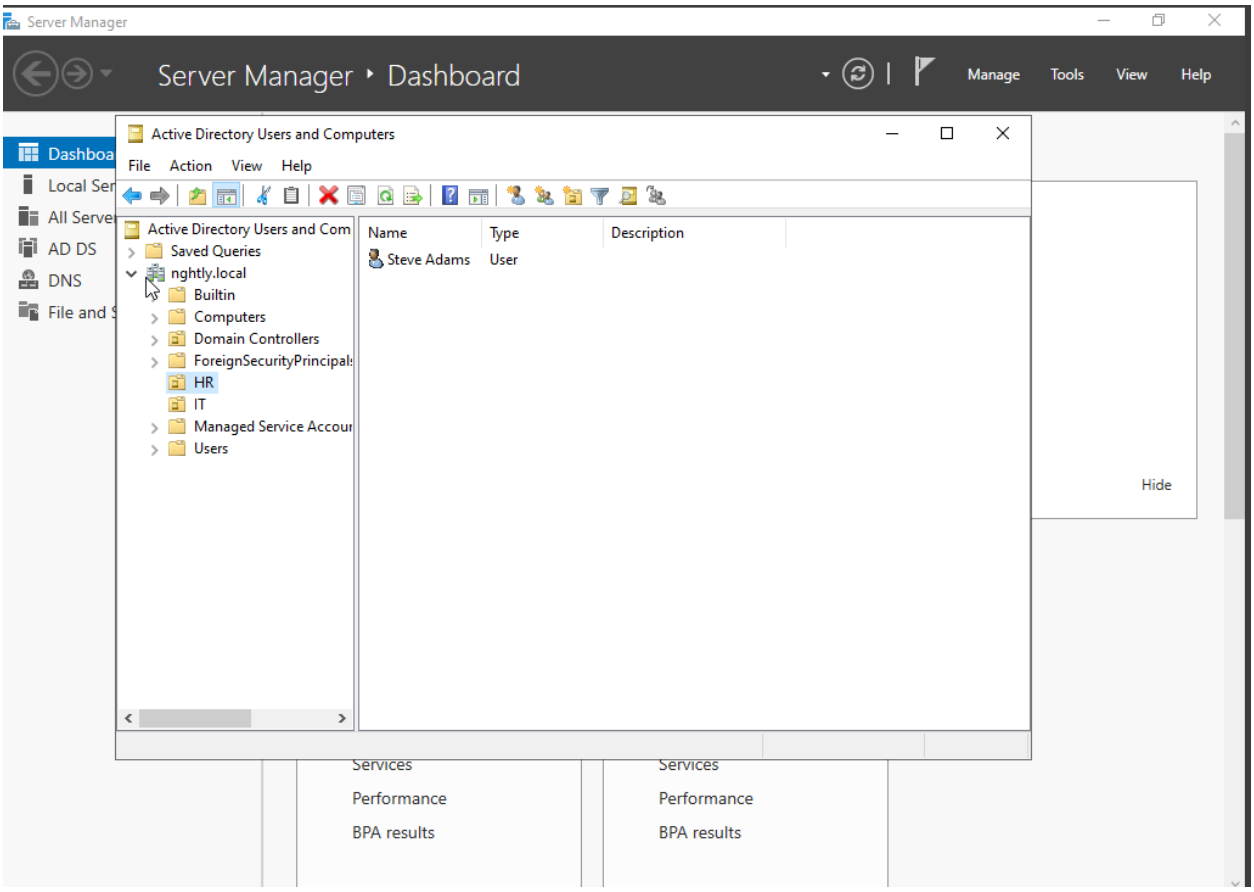


The images show the Splunk Search & Reporting interface, displaying events collected from the environment, and forwarded to the Splunk server.

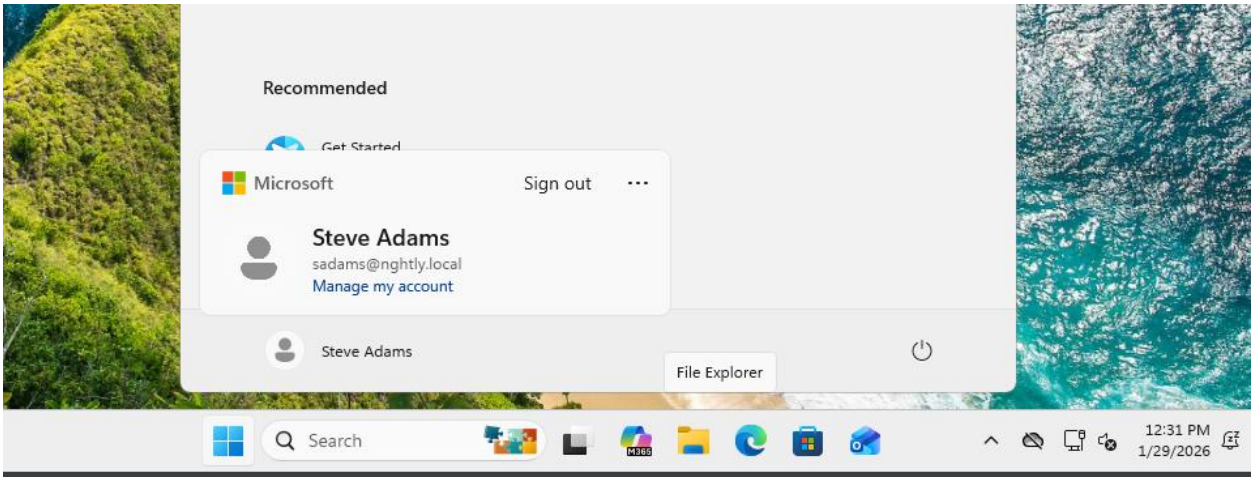
The highlighted `source` field breakdown shows the origin of the collected logs. In this case, Splunk has received events from four main sources:

- **Microsoft-Windows-Sysmon/Operational** – most events, used for detailed system activity monitoring such as process creation and network connections
- **WinEventLog:Security** – Windows security logs, including authentication attempts and account-related events
- **WinEventLog:System** – system-level events related to services and OS behavior
- **WinEventLog:Application** – application-related logs

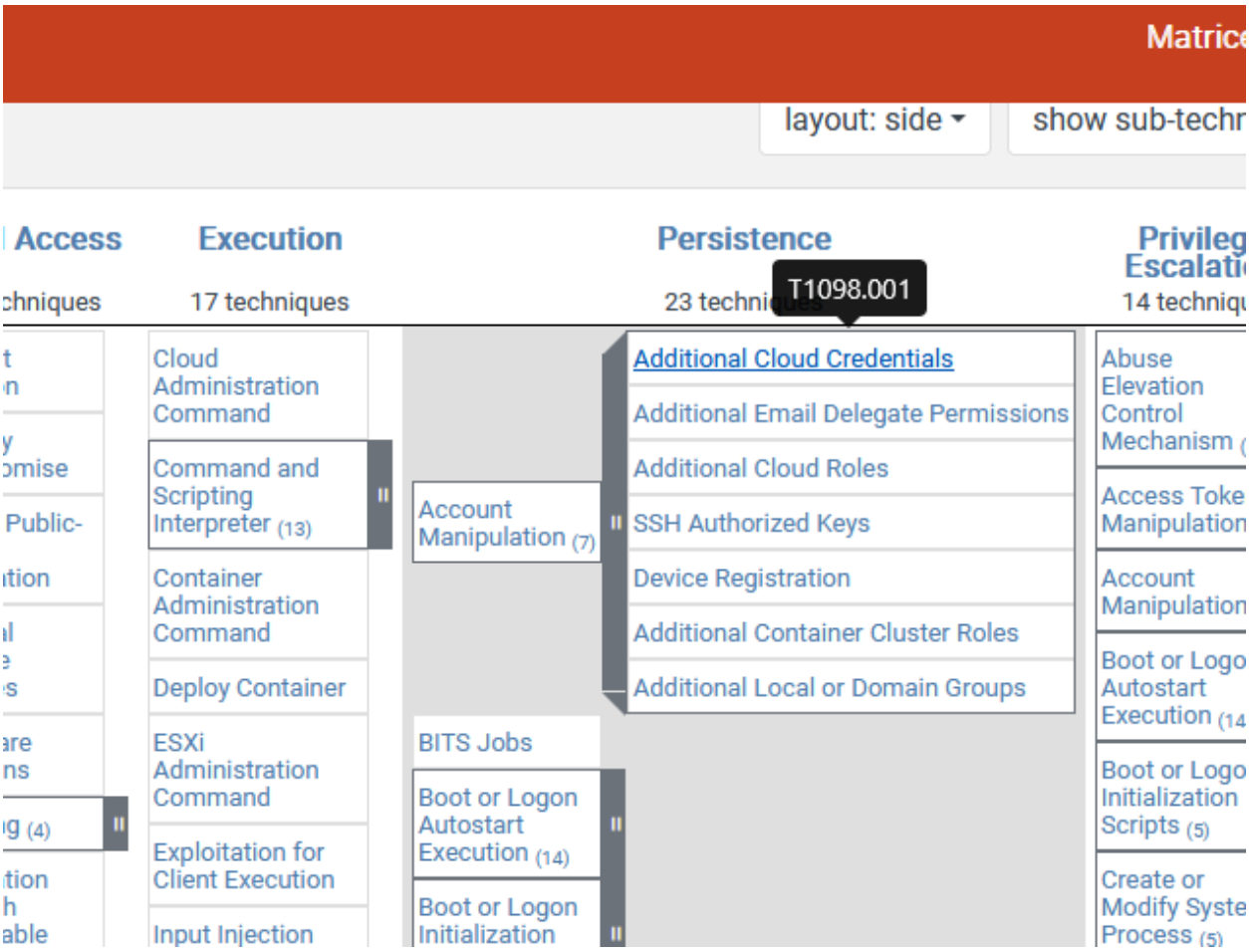
The event counts and percentages demonstrate that logs are being successfully forwarded from Windows hosts to Splunk



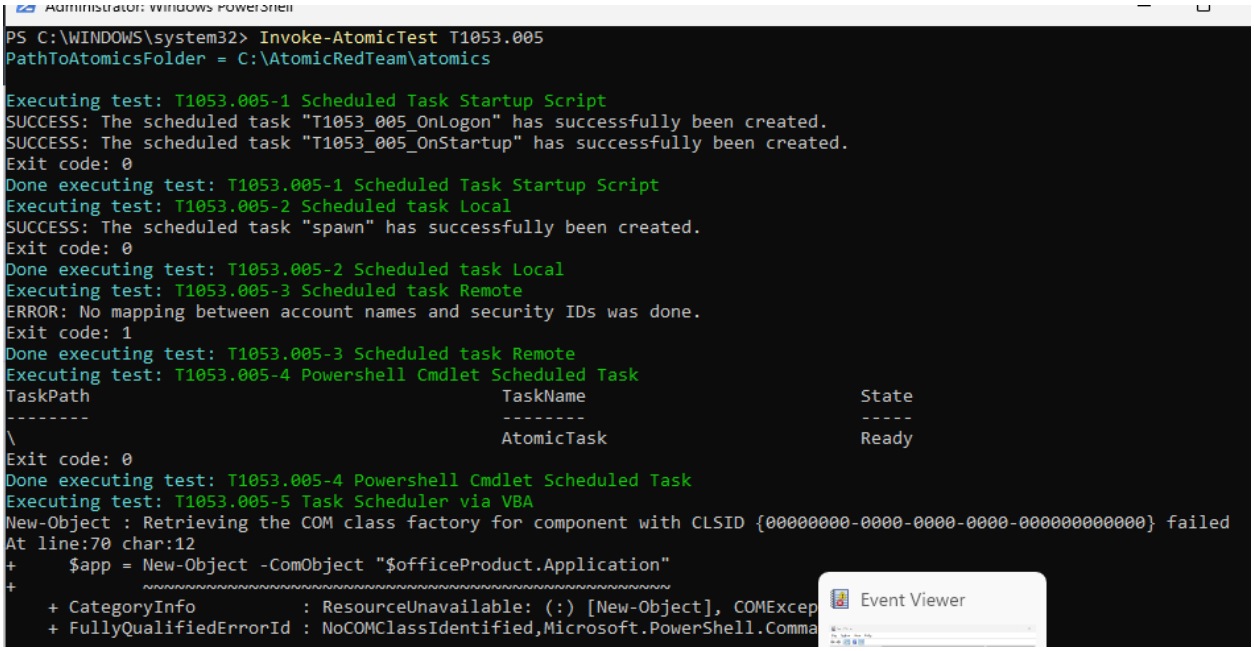
Active Directory user's setup with passwords on a local server



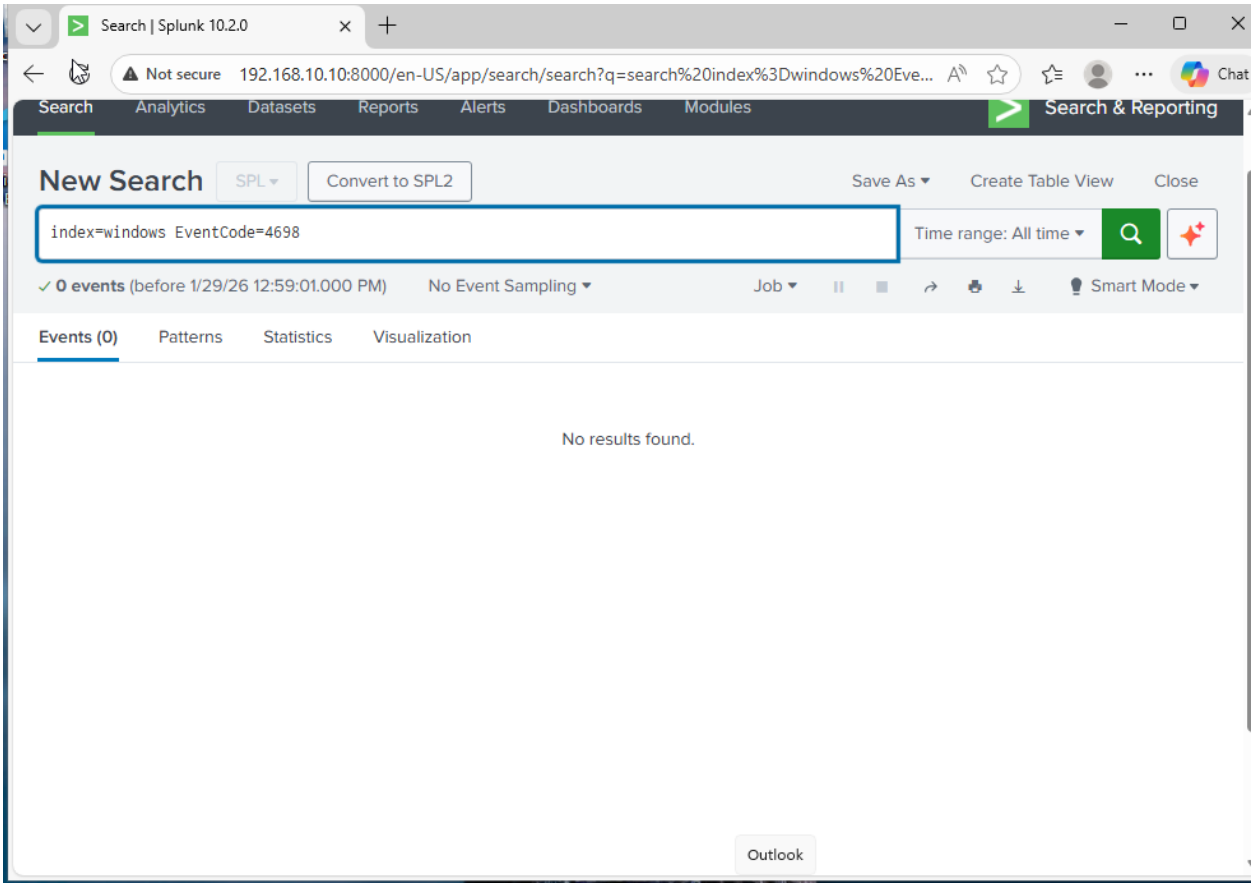
User logged on the targeted domain



ITRE ATT&CK Enterprise Matrix, and it's essentially a map of how attackers operate, step by step, once they target an environment like Active Directory.



Scheduled task attack



Splunk showcasing that we're not protected against a scheduled task attack