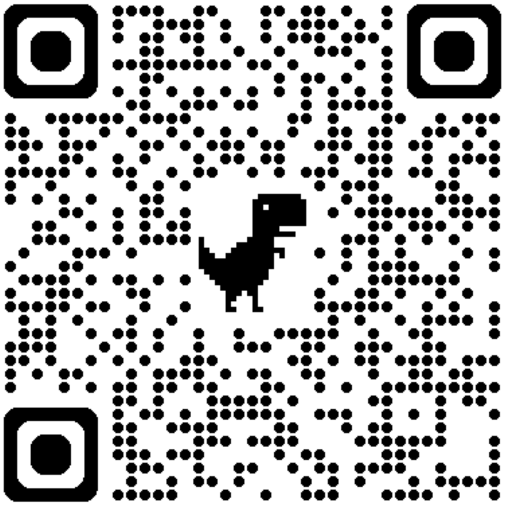
Windows Server Home Lab



Link to Documentation, all Screenshots and all other files on Github.

Event Log Forwarding

Set up centralized log collection from a domain-joined client to the Domain Controller using Windows Event Collector.

Implementation

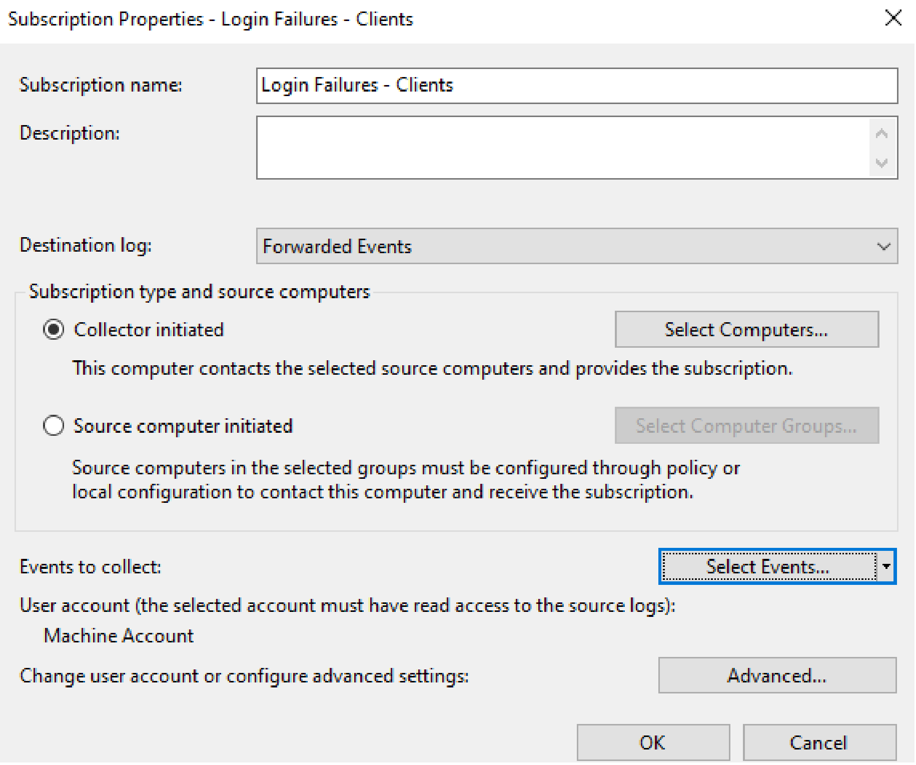
- On the Domain Controller, opened Event Viewer > Subscriptions > Created a new subscription for Event ID 4625 (Logon Failures).
- Added the client machine using 'Select Computers' and chose 'Minimize Latency'.
- On the client, opened PowerShell as administrator and ran 'wecutil qc' to configure Windows Event Collector.
- Enabled WinRM service using 'Start-Service WinRM'.

Issue

Subscription status showed 'Access is denied (0x5)'.

Resolution

- Opened 'Active Directory Users and Computers' > Navigated to 'Builtin > Event Log Readers'.
- Added the client computer by typing 'ADVM$', clicking 'Object Types' and selecting 'Computers'.
- Forced Group Policy update with 'gpupdate /force'.
- Restarted EventLog and WinRM services.
- Verified success in Event Viewer > Subscriptions > Runtime Status and saw logs populate under 'Forwarded Events'.



Subscription Properties - Login Failures - Clients

Subscription name: Login Failures - Clients

Description:

Destination log: Forwarded Events

Subscription type and source computers

● Collector initiated

This computer contacts the selected source computers and provides the subscription.

○ Source computer initiated

Source computers in the selected groups must be configured through policy or local configuration to contact this computer and receive the subscription.

Events to collect:

User account (the selected account must have read access to the source logs):

Machine Account

Change user account or configure advanced settings:

Backup and Restore Simulation

Simulate system state backup and restore in preparation for domain recovery.

Implementation

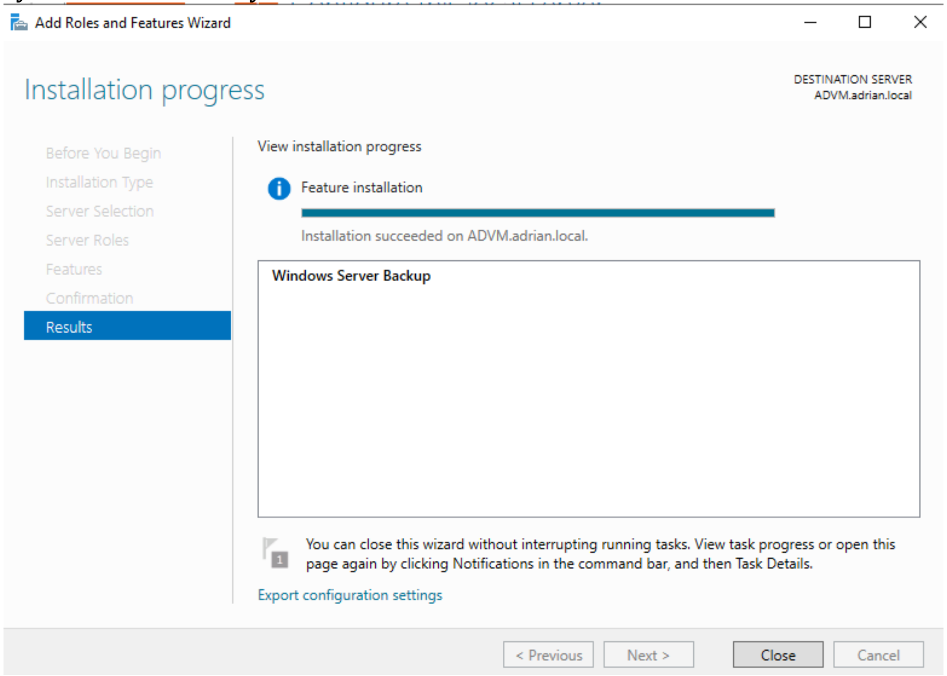
- Installed 'Windows Server Backup' via Server Manager > Features.
- Opened 'Windows Server Backup' > Chose 'Backup Once' > Selected 'Custom' > Added 'System State'.
- Saved the backup to a secondary drive.
- Deleted a domain user via 'Active Directory Users and Computers' to simulate accidental removal.

Issue

Full system state restore could not be performed without entering Directory Services Restore Mode (DSRM).

Resolution

- Walked through the 'Recover' wizard up to confirmation to show process.
- Noted that full restoration would require reboot into DSRM and running: 'wbadmin start systemstaterecovery -version:<version>'.



Installation progress

DESTINATION SERVER
ADVM.adrian.local

View installation progress

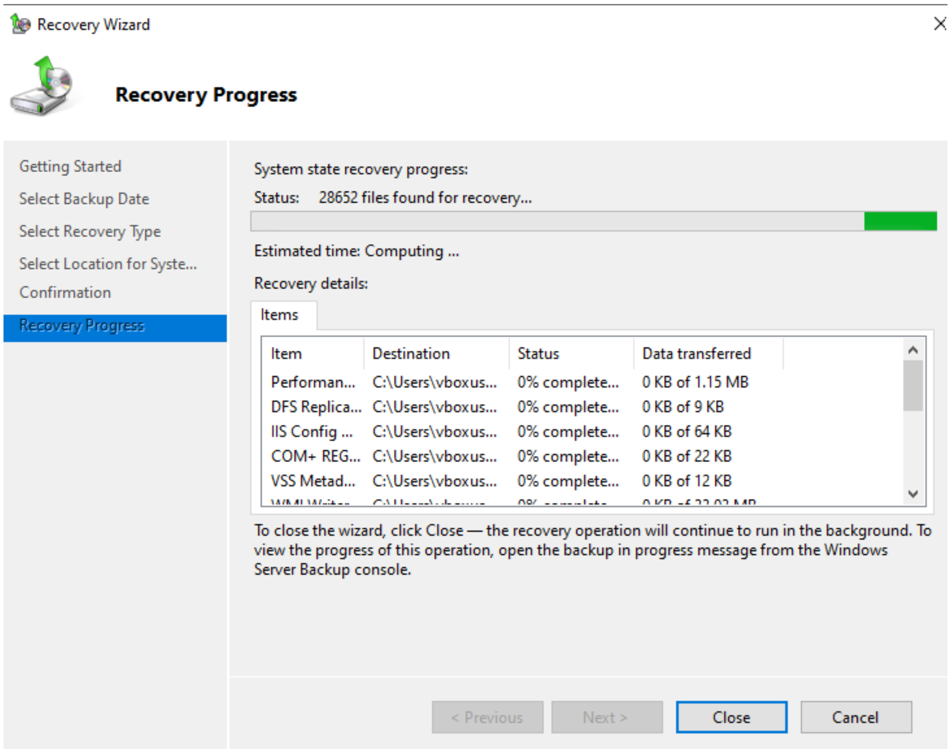
Feature installation

Installation succeeded on ADVM.adrian.local.

Windows Server Backup

You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

Export configuration settings



Recovery Progress

System state recovery progress:

Status: 28652 files found for recovery...

Estimated time: Computing ...

Recovery details:

Item	Destination	Status	Data transferred
Performan...	C:\Users\vboxus...	0% complete...	0 KB of 1.15 MB
DFS Replica...	C:\Users\vboxus...	0% complete...	0 KB of 9 KB
IIS Config ...	C:\Users\vboxus...	0% complete...	0 KB of 64 KB
COM+ REG...	C:\Users\vboxus...	0% complete...	0 KB of 22 KB
VSS Metad...	C:\Users\vboxus...	0% complete...	0 KB of 12 KB
WMI Writer...	C:\Users\vboxus...	0% complete...	0 KB of 22.02 MB

To close the wizard, click Close — the recovery operation will continue to run in the background. To view the progress of this operation, open the backup in progress message from the Windows Server Backup console.

DHCP + DNS Logging

Track IP lease distribution and DNS queries through built-in logging systems.

Implementation

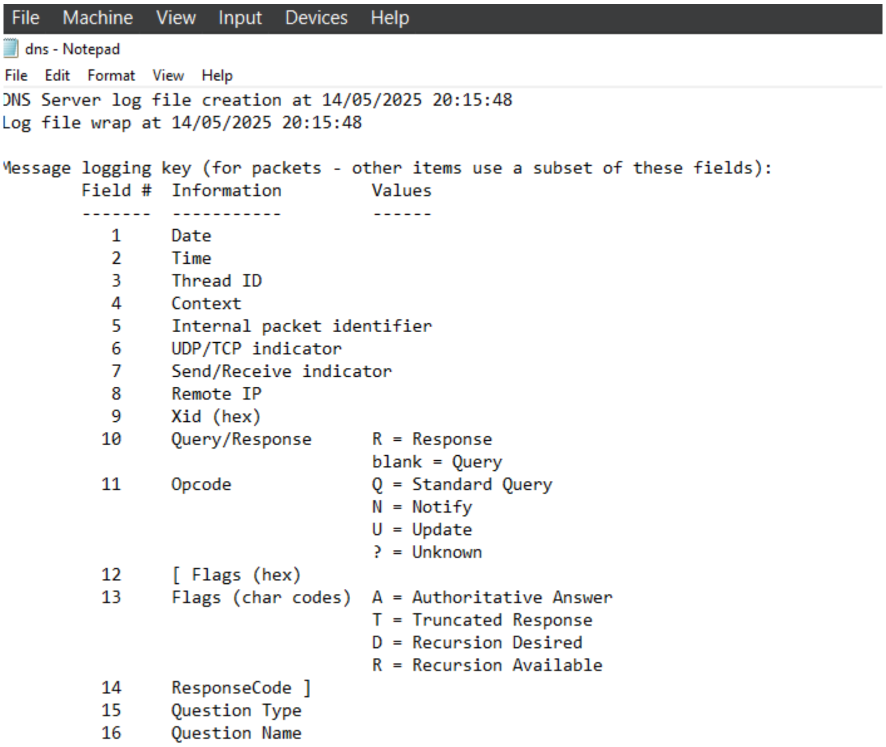
- Installed DHCP and DNS roles via Server Manager.
- Configured a DHCP scope: 10.0.2.100–150 with gateway and DNS pointing to the DC.
- Verified lease by renewing client IP using 'ipconfig /release' and 'ipconfig /renew'.
- For DNS, opened DNS Manager > Server Properties > Enabled Debug Logging.

Issue

DHCP logs were empty despite clients online.

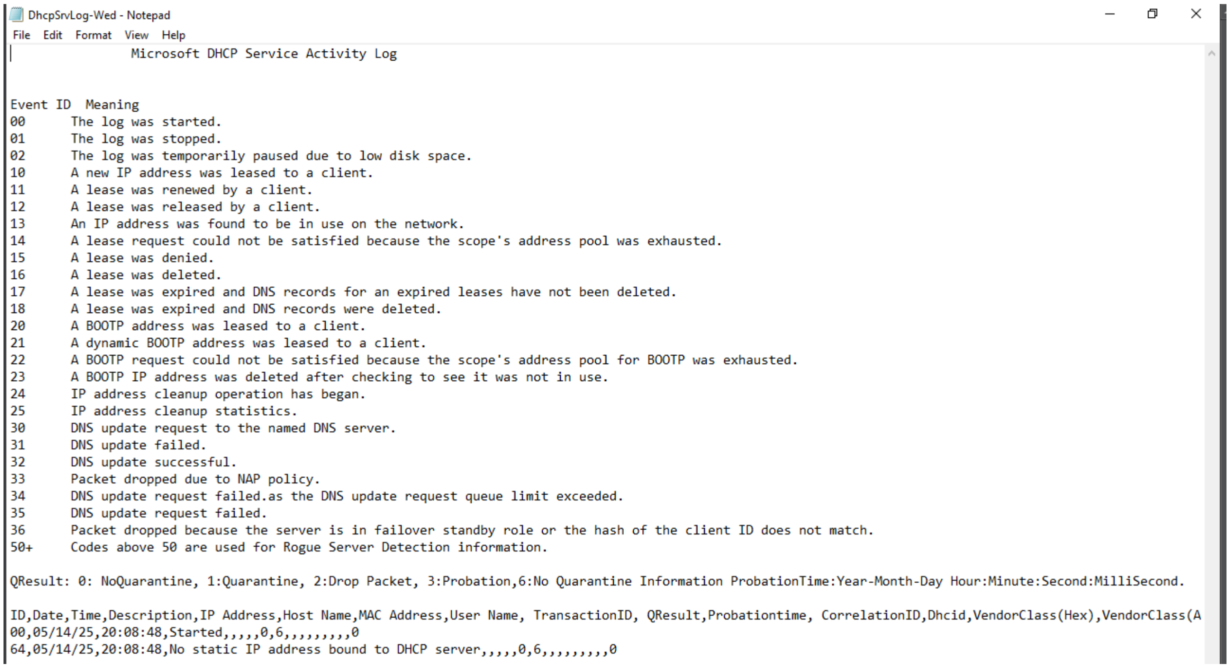
Resolution

- Opened Event Viewer > Applications and Services > Microsoft > Windows > DHCP Server > Operational.
- Found logs confirming lease events.
- Verified DHCP log files in 'C:\Windows\System32\dhcp\DhcpSrvLog-*.log'.
- Opened 'dns.log' in Notepad to inspect query and response traffic.



```
DNS Server log file creation at 14/05/2025 20:15:48
Log file wrap at 14/05/2025 20:15:48

Message logging key (for packets - other items use a subset of these fields):
	Field #  Information         Values
	-------  -----------         ------
	   1     Date
	   2     Time
	   3     Thread ID
	   4     Context
	   5     Internal packet identifier
	   6     UDP/TCP indicator
	   7     Send/Receive indicator
	   8     Remote IP
	   9     Xid (hex)
	  10     Query/Response      R = Response
	                             blank = Query
	  11     Opcode              Q = Standard Query
	                             N = Notify
	                             U = Update
	                             ? = Unknown
	  12     [ Flags (hex)
	  13     Flags (char codes)  A = Authoritative Answer
	                             T = Truncated Response
	                             D = Recursion Desired
	                             R = Recursion Available
	  14     ResponseCode ]
	  15     Question Type
	  16     Question Name
```

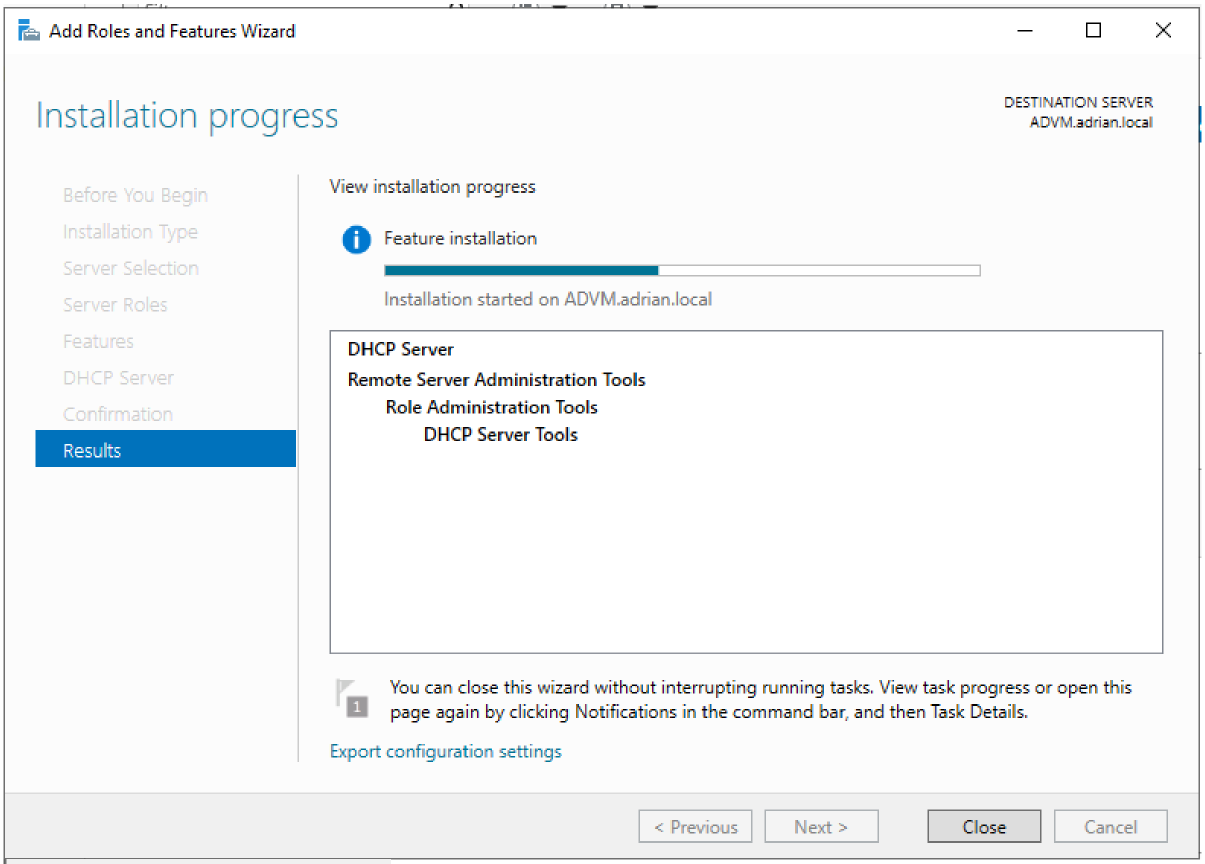


```
		Microsoft DHCP Service Activity Log


Event ID  Meaning
00	The log was started.
01	The log was stopped.
02	The log was temporarily paused due to low disk space.
10	A new IP address was leased to a client.
11	A lease was renewed by a client.
12	A lease was released by a client.
13	An IP address was found to be in use on the network.
14	A lease request could not be satisfied because the scope's address pool was exhausted.
15	A lease was denied.
16	A lease was deleted.
17	A lease was expired and DNS records for an expired leases have not been deleted.
18	A lease was expired and DNS records were deleted.
20	A BOOTP address was leased to a client.
21	A dynamic BOOTP address was leased to a client.
22	A BOOTP request could not be satisfied because the scope's address pool for BOOTP was exhausted.
23	A BOOTP IP address was deleted after checking to see it was not in use.
24	IP address cleanup operation has began.
25	IP address cleanup statistics.
30	DNS update request to the named DNS server.
31	DNS update failed.
32	DNS update successful.
33	Packet dropped due to NAP policy.
34	DNS update request failed.as the DNS update request queue limit exceeded.
35	DNS update request failed.
36	Packet dropped because the server is in failover standby role or the hash of the client ID does not match.
50+	Codes above 50 are used for Rogue Server Detection information.

QResult: 0: NoQuarantine, 1:Quarantine, 2:Drop Packet, 3:Probation,6:No Quarantine Information ProbationTime:Year-Month-Day Hour:Minute:Second:MilliSecond.

ID,Date,Time,Description,IP Address,Host Name,MAC Address,User Name, TransactionID, QResult,Probationtime, CorrelationID,Dhcid,VendorClass(Hex),VendorClass(A
00,05/14/25,20:08:48,Started,,,,,0,6,,,,,,,,,0
64,05/14/25,20:08:48,No static IP address bound to DHCP server,,,,,0,6,,,,,,,,,0
```



Installation progress

DESTINATION SERVER
ADVM.adrian.local

View installation progress

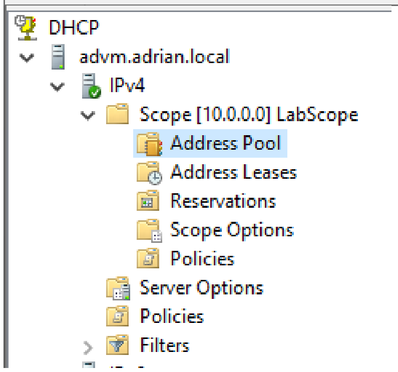
Feature installation

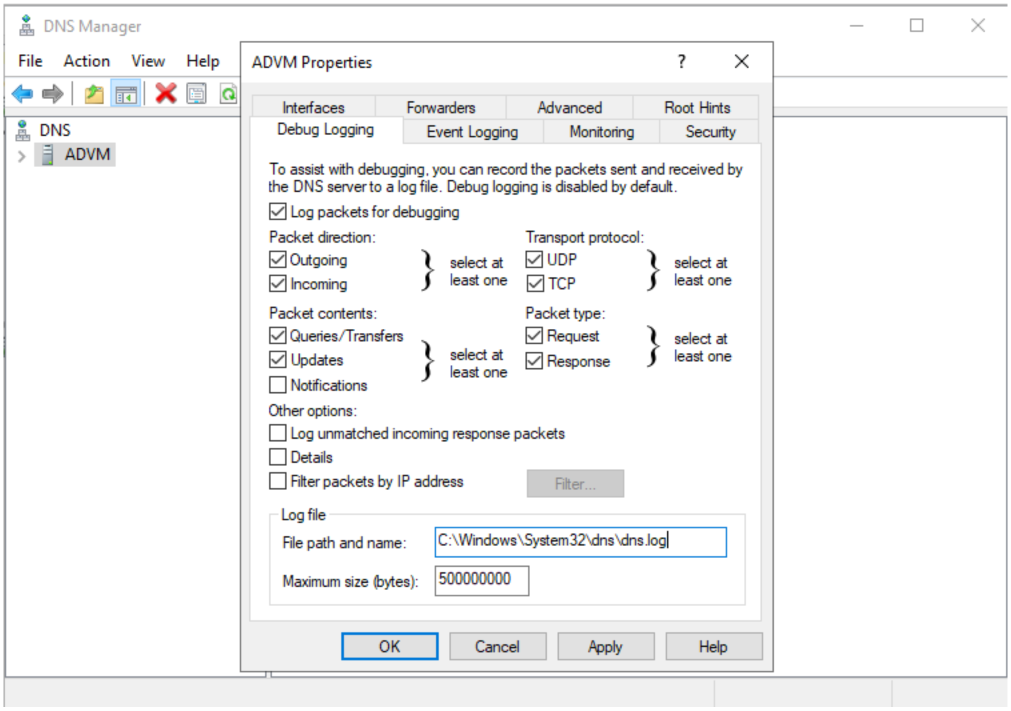
Installation started on ADVM.adrian.local

DHCP Server
Remote Server Administration Tools
    Role Administration Tools
        DHCP Server Tools

You can close this wizard without interrupting running tasks. View task progress or open this page again by clicking Notifications in the command bar, and then Task Details.

Export configuration settings





To assist with debugging, you can record the packets sent and received by the DNS server to a log file. Debug logging is disabled by default.

☑ Log packets for debugging

Packet direction:
☑ Outgoing
☑ Incoming
} select at least one

Transport protocol:
☑ UDP
☑ TCP
} select at least one

Packet contents:
☑ Queries/Transfers
☑ Updates
☐ Notifications
} select at least one

Packet type:
☑ Request
☑ Response
} select at least one

Other options:
☐ Log unmatched incoming response packets
☐ Details
☐ Filter packets by IP address

Log file
File path and name: C:\Windows\System32\dns\dns.log
Maximum size (bytes): 500000000

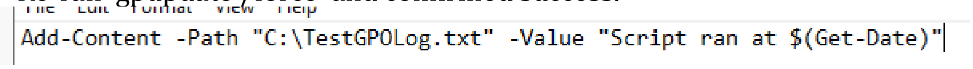
Group Policy and Scheduled Tasks

Apply GPOs to deploy daily scheduled tasks and configure login banner.

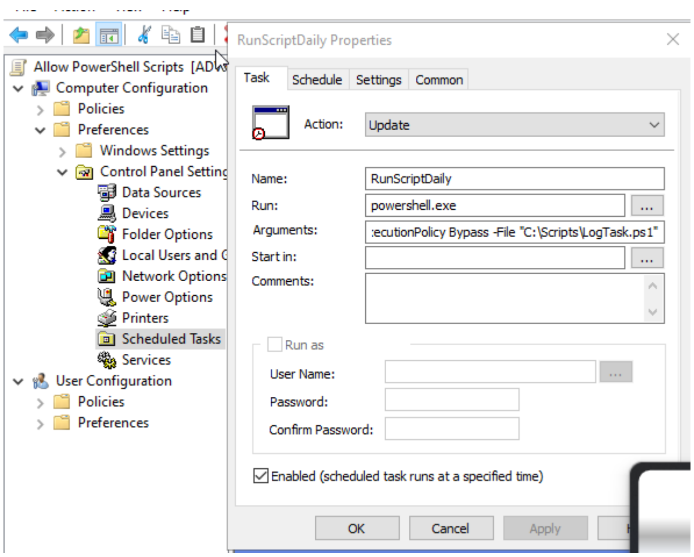
Implementation
- Created a GPO linked to 'IT Team' OU.
- Configured: User Configuration > Preferences > Control Panel Settings > Scheduled Tasks.
- Set task to run PowerShell script from C:\Scripts\LogTask.ps1 with elevated privileges.
- Used 'schtasks' to confirm registration.
- Configured login banner using: Computer Configuration > Policies > Windows Settings > Security Settings > Local Policies > Security Options.

Issue
Task failed due to blocked script execution.

Resolution
- Enabled GPO: 'Turn on Script Execution' > Allow all scripts.
- Re-ran 'gpupdate /force' and confirmed success.



```
Add-Content -Path "C:\TestGPOLog.txt" -Value "Script ran at $(Get-Date)"
```



Action: Update

Name: RunScriptDaily

Run: powershell.exe

Arguments: :ecutionPolicy Bypass -File "C:\Scripts\LogTask.ps1"

Start in:

Comments:

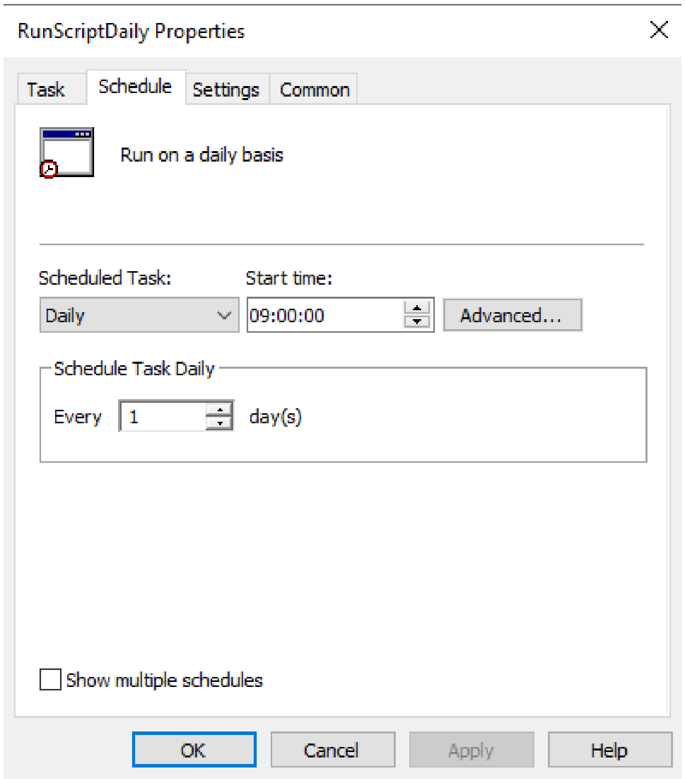
□ Run as

User Name:

Password:

Confirm Password:

☑ Enabled (scheduled task runs at a specified time)



Run on a daily basis

Scheduled Task: Daily

Start time: 09:00:00

Schedule Task Daily

Every 1 day(s)

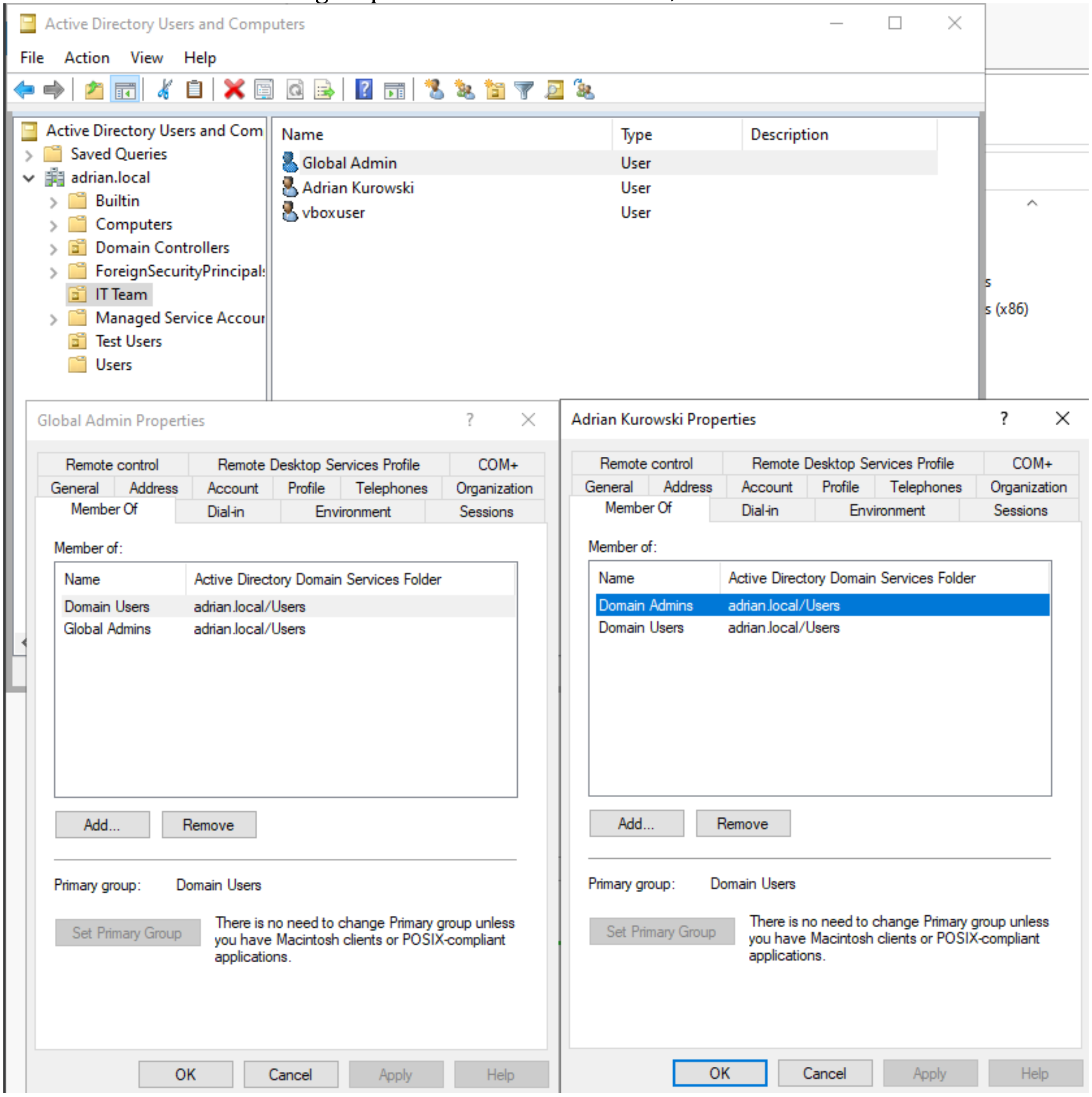
□ Show multiple schedules

Active Directory Domain Services

- Installed and configured Windows Server 2022 using VirtualBox.
- Promoted the server to a Domain Controller with domain name 'adrian.local'.
- Created Organizational Unit (OU) named 'IT Team'.

-Practiced creating, disabling, and renaming domain user accounts in Active Directory Users and Computers.

- Created a custom Admin group and added the user to it, then linked it to Domain Admins.



Name	Type	Description
Global Admin	User	
Adrian Kurowski	User	
vboxuser	User	

Global Admin Properties

Member of:

Name	Active Directory Domain Services Folder
Domain Users	adrian.local/Users
Global Admins	adrian.local/Users

Primary group: Domain Users

There is no need to change Primary group unless you have Macintosh clients or POSIX-compliant applications.

Adrian Kurowski Properties

Member of:

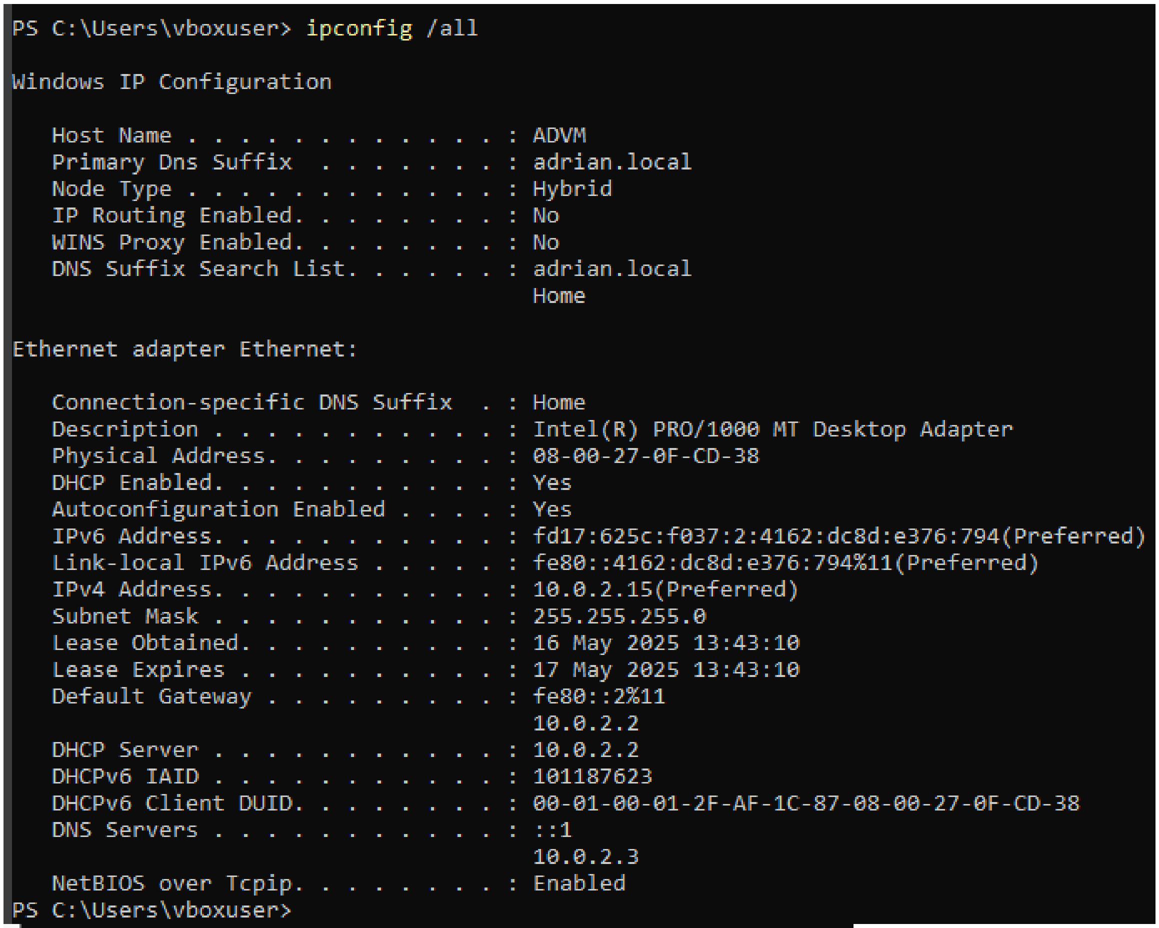
Name	Active Directory Domain Services Folder
Domain Admins	adrian.local/Users
Domain Users	adrian.local/Users

Primary group: Domain Users

There is no need to change Primary group unless you have Macintosh clients or POSIX-compliant applications.

Networking and DHCP Configuration

- Configured networking using internal adapter in VirtualBox to allow VM-to-VM communication.
- Set static IP and DNS manually on the client VM for domain join.
- Verified IP address assignment and DNS resolution using ipconfig and Test-NetConnection.
- Enabled DHCP on the server for dynamic IP assignment (testing purposes).



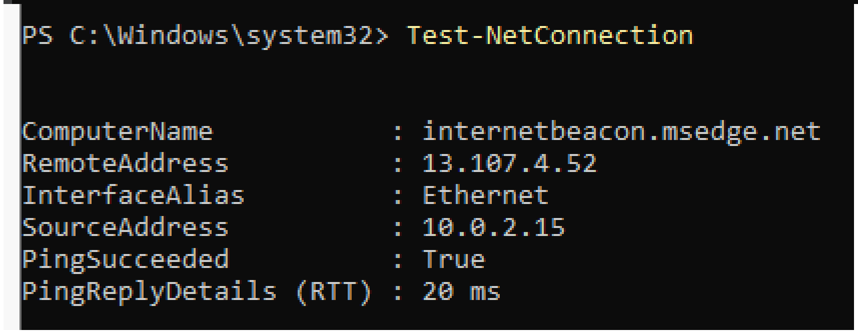
```
PS C:\Users\vboxuser> ipconfig /all

Windows IP Configuration

   Host Name . . . . . . . . . . . . : ADVM
   Primary Dns Suffix  . . . . . . . : adrian.local
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : adrian.local
                                       Home

Ethernet adapter Ethernet:

   Connection-specific DNS Suffix  . : Home
   Description . . . . . . . . . . . : Intel(R) PRO/1000 MT Desktop Adapter
   Physical Address. . . . . . . . . : 08-00-27-0F-CD-38
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   IPv6 Address. . . . . . . . . . . : fd17:625c:f037:2:4162:dc8d:e376:794(Preferred)
   Link-local IPv6 Address . . . . . : fe80::4162:dc8d:e376:794%11(Preferred)
   IPv4 Address. . . . . . . . . . . : 10.0.2.15(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : 16 May 2025 13:43:10
   Lease Expires . . . . . . . . . . : 17 May 2025 13:43:10
   Default Gateway . . . . . . . . . : fe80::2%11
                                       10.0.2.2
   DHCP Server . . . . . . . . . . . : 10.0.2.2
   DHCPv6 IAID . . . . . . . . . . . : 101187623
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2F-AF-1C-87-08-00-27-0F-CD-38
   DNS Servers . . . . . . . . . . . : ::1
                                       10.0.2.3
   NetBIOS over Tcpip. . . . . . . . : Enabled
PS C:\Users\vboxuser>
```

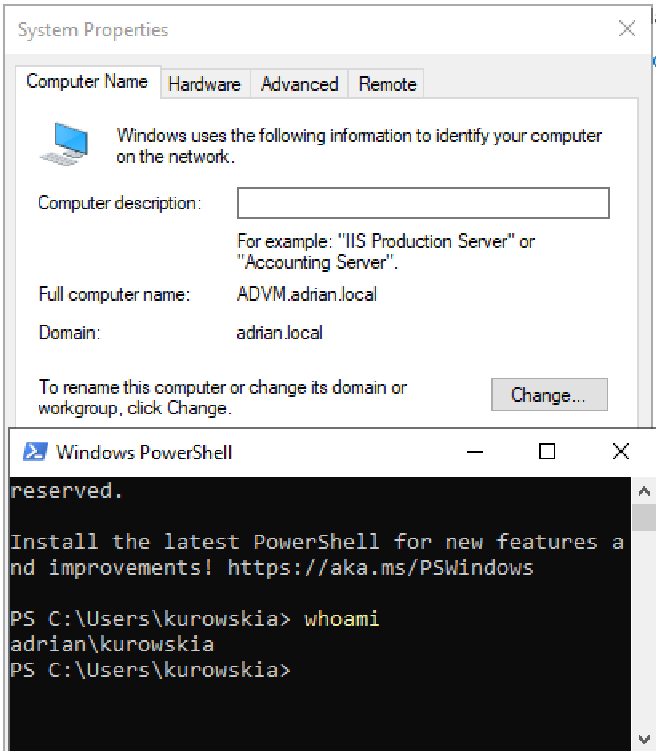


```
PS C:\Windows\system32> Test-NetConnection


ComputerName           : internetbeacon.msedge.net
RemoteAddress          : 13.107.4.52
InterfaceAlias         : Ethernet
SourceAddress          : 10.0.2.15
PingSucceeded          : True
PingReplyDetails (RTT) : 20 ms
```

Windows Client VM Setup

- Created a second VM (Windows 11) and installed the OS using official ISO.
- Configured NIC to be on the same internal network as the Domain Controller.
- Successfully joined the Windows 11 client to the 'adrian.local' domain.
- Tested logging in with domain user accounts.



Windows uses the following information to identify your computer on the network.

Computer description:

For example: "IIS Production Server" or "Accounting Server".

Full computer name: ADVM.adrian.local

Domain: adrian.local

To rename this computer or change its domain or workgroup, click Change.

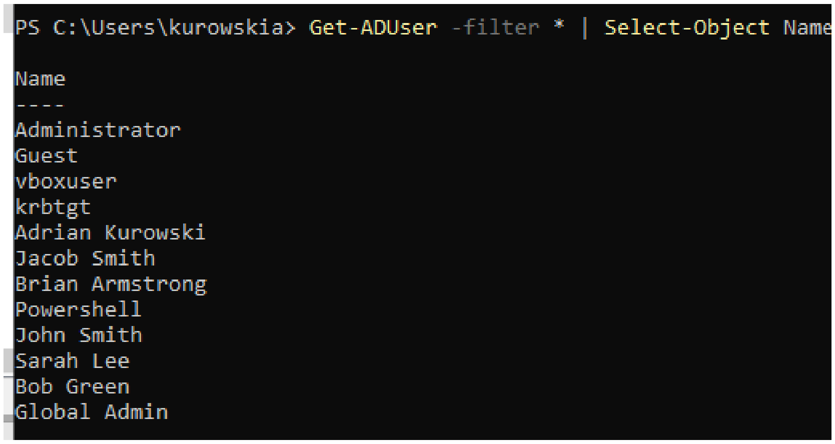
```
reserved.

Install the latest PowerShell for new features a
nd improvements! https://aka.ms/PSWindows

PS C:\Users\kurowskia> whoami
adrian\kurowskia
PS C:\Users\kurowskia>
```

PowerShell Basics

- Practiced using PowerShell for AD user queries and system checks.
- Used commands like Get-ADUser, Export-CSV, Set-DnsClientServerAddress, and Test-NetConnection.

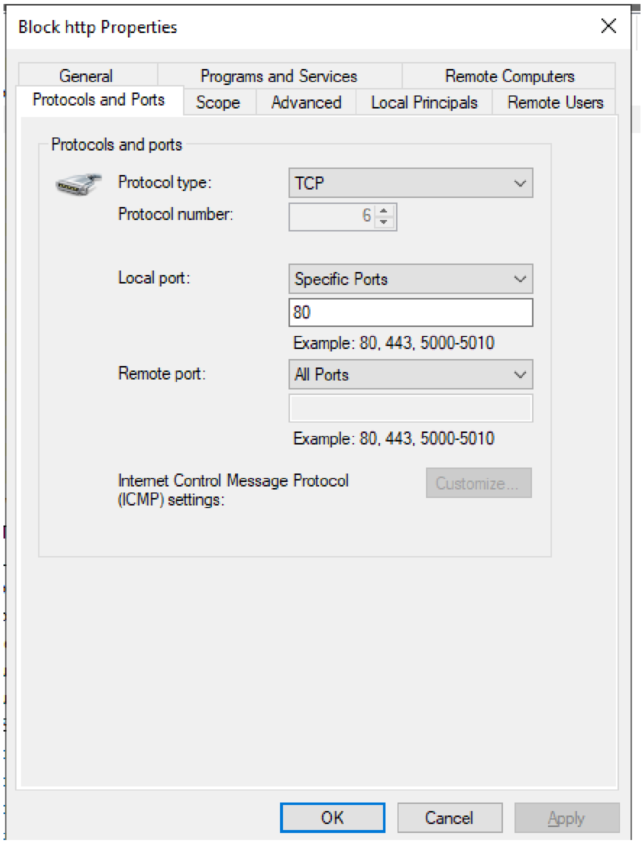


```
PS C:\Users\kurowskia> Get-ADUser -filter * | Select-Object Name

Name
----
Administrator
Guest
vboxuser
krbtgt
Adrian Kurowski
Jacob Smith
Brian Armstrong
Powershell
John Smith
Sarah Lee
Bob Green
Global Admin
```

Windows Firewall and Port Testing

- Created inbound rules to block/allow specific ports (e.g., port 80 for HTTP).
- Verified traffic using Test-NetConnection and netstat -ano.
- Installed Telnet client and tested local port connectivity.



Protocols and ports

Protocol type: TCP

Protocol number: 6

Local port: Specific Ports

80

Example: 80, 443, 5000-5010

Remote port: All Ports

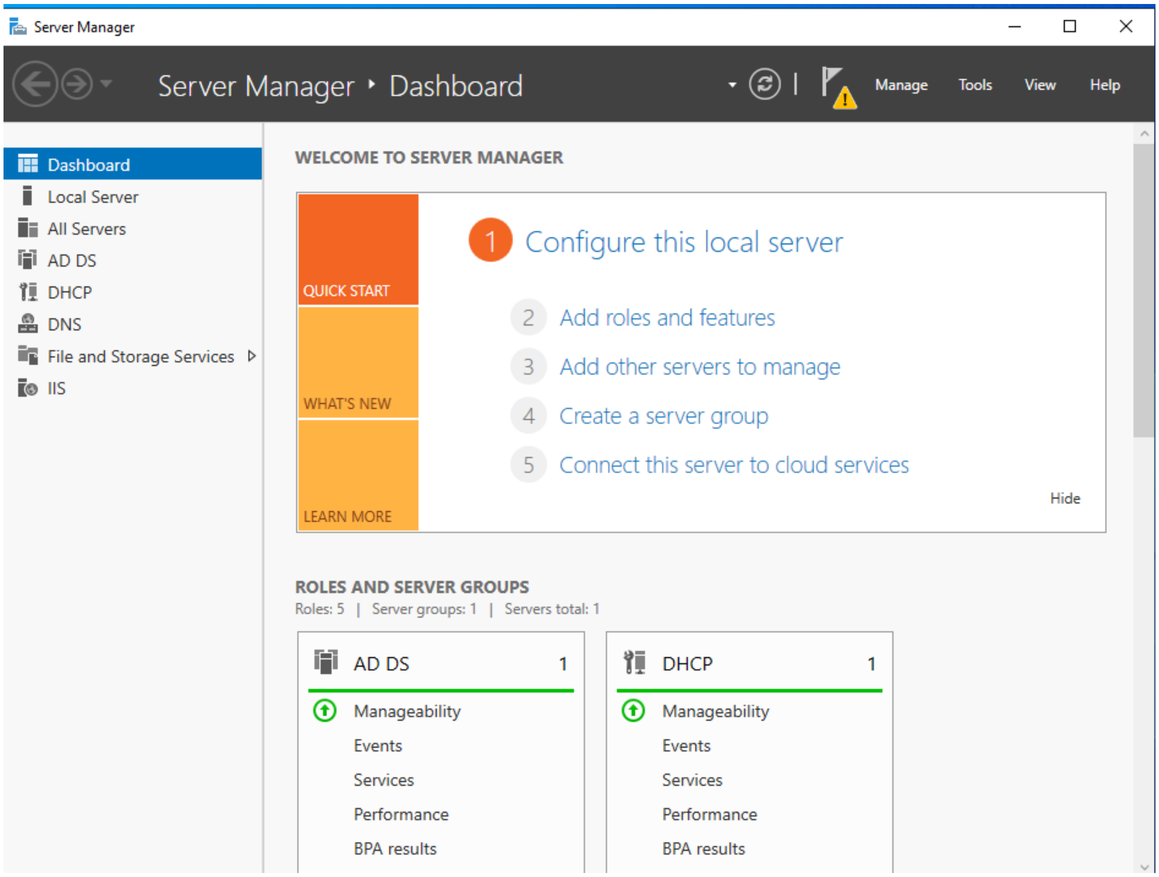
Example: 80, 443, 5000-5010

Internet Control Message Protocol (ICMP) settings:

Troubleshooting & Lessons Learned

- No network on VM: Resolved by switching VirtualBox adapter to 'Internal Network' and setting static IP.
- Firewall not blocking port 80: Checked rule scope > Confirmed with 'Test-NetConnection' and 'netstat'.
- OU move failed: Removed 'Protect from accidental deletion' via ADUC > Object tab.

- Telnet failed: Enabled feature via 'Turn Windows Features On or Off'.



Server Manager
Server Manager ‣ Dashboard
Manage
Tools
View
Help
Dashboard
Local Server
All Servers
AD DS
DHCP
DNS
File and Storage Services
IIS
WELCOME TO SERVER MANAGER
QUICK START
WHAT'S NEW
LEARN MORE
1 Configure this local server
2 Add roles and features
3 Add other servers to manage
4 Create a server group
5 Connect this server to cloud services
Hide
ROLES AND SERVER GROUPS
Roles: 5 | Server groups: 1 | Servers total: 1
AD DS 1
Manageability
Events
Services
Performance
BPA results
DHCP 1
Manageability
Events
Services
Performance
BPA results