

PowerShell

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Active Directory

Get-SMBOpenFile

Basics

Errors and Solutions

This page contains a list of common PowerShell errors and their solutions.

Invoke-WebRequest : The request was aborted: Could not create SSL/TLS secure channel.

The cause of the error is that PowerShell, by default, uses TLS 1.0 to make https requests. TLS 1.0 has been broken for a long time now and is no longer supported by most websites. You can change this behavior with running any of the below command to use all protocols. You can also specify single protocol.

```
[Net.ServicePointManager]::SecurityProtocol = "Tls12"
```

```
[Net.ServicePointManager]::SecurityProtocol = [Net.SecurityProtocolType]::Tls,  
[Net.SecurityProtocolType]::Tls11, [Net.SecurityProtocolType]::Tls12, [Net.SecurityProtocolType]::Ssl3
```

```
[Net.ServicePointManager]::SecurityProtocol = "Tls, Tls11, Tls12, Ssl3"
```

#end

Firewall management

List firewall rules with ICMP in the DisplayName

```
Get-NetFirewallRule | Where-Object DisplayName -Like "*ICMP*" | Sort-Object Enabled,Name | Format-Table
```

Enable ICMP Echo Request

```
Set-NetFirewallRule -DisplayName "File and Printer Sharing (Echo Request - ICMPv4-In)" -enabled True
```

```
Set-NetFirewallRule -DisplayName "File and Printer Sharing (Echo Request - ICMPv6-In)" -enabled True
```

Group Policy and PowerShell

You can manage Group Policy via PowerShell... who knew!? ☐☐

Listing GPOs

```
Get-GPO -All | Sort-Object -Property DisplayName | FT -Property DisplayName,Owner,GpoStatus,Description
```

```
Get-GPO -All -Domain domain.loc -Server dc1.domain.loc | Sort-Object -Property DisplayName | FT -Property  
DisplayName,Owner,GpoStatus,Description
```

Generating GPO reports

```
# Generate a GPO Report for a single named GPO  
$gpoName = "PowerShell Logging"  
Get-GPO -All | Where-Object { $_.DisplayName -eq $gpoName } | ForEach-Object {  
    $reportPath = "C:\GPOReports\" + $_.DisplayName + ".html"  
    Get-GPOReport -GUID $_.ID -ReportType HTML -Path "$($reportPath)"  
}
```

```
# Generate GPO reports for all GPOs in the current domain  
$queryDomain = $env:USERDNSDOMAIN  
$queryServer = ($env:LOGONSERVER).replace("\\", "") + "." + $env:USERDNSDOMAIN  
Get-GPO -All -Domain $queryDomain -Server $queryServer | Sort-Object -Property DisplayName | ForEach-Object  
{  
    $reportPath = "C:\GPOReports\" + $_.DomainName + " - " + $_.DisplayName.replace("/", "_") + ".html"  
    "Generating report for $(($_.DisplayName)) in $($reportPath)..."  
    Get-GPOReport -Domain $queryDomain -Server $queryServer -GUID $_.ID -ReportType HTML -Path  
    "$($reportPath)"  
}
```

#end

Querying Event Logs

I noticed that there is a huge speed difference between using an XML Query and PowerShell Get-EventLog piped through Where-Object to filter event logs. Thanks to [this article](#), I learned how to use the XML Query via PowerShell, so you get the best of both worlds.

Know your version

Here's different commands that will show you which version PowerShell you're running.

```
$PSVersionTable.PSVersion
```

```
Get-Host
```

```
$host
```

```
$host.version
```

General concepts

There are two different cmdlets for accessing Windows Event Logs. Get-WinEvent is a newer version of Get-EventLog.

Get-WinEvent

- You have access to more information
- Because you have more information, it might take more effort to filter the data

Get-EventLog

- One clear advantage: you can use the **-After** and **-Before** attributes to easily filter results by date

Filtering results

If you want to know how to filter the results, simply pipe the cmdlet to Get-Member:

```
Get-EventLog system -newest 1 | Get-Member
```

The output of the command clearly shows you the methods and properties returned:

```
PS C:\> Get-EventLog system -newest 1 | Get-Member
```

TypeName: System.Diagnostics.EventLogEntry#system/nhi/1074012975

Name	MemberType	Definition
----	-----	-----
Disposed	Event	System.EventHandler Disposed(System.Object, System.EventArgs)
CreateObjRef	Method	System.Runtime.Remoting.ObjRef CreateObjRef(type requestedType)
Dispose	Method	void Dispose(), void IDisposable.Dispose()
Equals	Method	bool Equals(System.Diagnostics.EventLogEntry otherEntry), bool Equals(System.Object obj)
GetHashCode	Method	int GetHashCode()
GetLifetimeService	Method	System.Object GetLifetimeService()
GetObjectData	Method	void ISerializable.GetObjectData(System.Runtime.Serialization.SerializationInfo info, System.Runtime.Serialization.StreamingContext context)
GetType	Method	type GetType()
InitializeLifetimeService	Method	System.Object InitializeLifetimeService()
ToString	Method	string ToString()
Category	Property	string Category {get;}
CategoryNumber	Property	int16 CategoryNumber {get;}
Container	Property	System.ComponentModel.IContainer Container {get;}
Data	Property	byte[] Data {get;}
EntryType	Property	System.Diagnostics.EventLogEntryType EntryType {get;}
Index	Property	int Index {get;}
InstanceId	Property	long InstanceId {get;}
MachineName	Property	string MachineName {get;}
Message	Property	string Message {get;}
ReplacementStrings	Property	string[] ReplacementStrings {get;}
Site	Property	System.ComponentModel.ISite Site {get;set;}
Source	Property	string Source {get;}
TimeGenerated	Property	datetime TimeGenerated {get;}
TimeWritten	Property	datetime TimeWritten {get;}

UserName	Property	string UserName {get;}
EventID	ScriptProperty	System.Object EventID {get=\$this.get_EventID() -band 0xFFFF;}

Get-EventLog Examples

Show available event logs and stats

```
Get-EventLog -List
```

get the most recent 10 system log entries

just change the LogName from System to Application, Security, etc. to access other logs

```
Get-EventLog -LogName System -Newest 10
```

get all system logs from the last 4 hours

```
Get-EventLog -LogName System -After (Get-Date).AddHours(-4)
```

get all system logs from the last 24 hours

```
Get-EventLog -LogName System -After (Get-Date).AddDays(-1)
```

View specific event using the event Index

```
Get-EventLog -LogName System -Index [Event_Index_Number] | Format-List
```

get the most recent 10 entries from a specific source

```
Get-EventLog -LogName System -Source Kerberos -Newest 10
```

```
Get-EventLog -LogName System -Source Microsoft-Windows-WLAN-AutoConfig -Newest 10
```

Get system logs from the last 24 hours from Source WLAN-AutoConfig

```
Get-EventLog -LogName system -After (Get-Date).AddDays(-1) -Source Microsoft-Windows-WLAN-AutoConfig
```

get the most recent 10 Error entries

```
Get-EventLog -LogName Application -EventType Error -Newest 10
```

```
Get-EventLog -LogName Security -EventType Error -Newest 10
```

```
Get-EventLog -LogName System -EventType Error -Newest 10
```

```
# Get list of Event Log Sources from the System log from the last 8 hours sorted by log count
Get-EventLog -LogName System -after (Get-Date).AddHours(-8) | Group-Object -Property Source -NoElement |
Select-Object -Property Count, Name | Sort-Object -Descending Count
```

```
# Find logins in the last 24 hours
Get-EventLog system -after (get-date).AddDays(-1) | where {$_.InstanceId -eq 7001}

# Find last computer start
$today = get-date -Hour 0 -Minute 0;
Get-EventLog system -after $today | sort -Descending | select -First 1
```

```
# Find logins and logoffs in the last 7 days
$logs = get-eventlog system -source Microsoft-Windows-Winlogon -After (Get-Date).AddDays(-7);
$res = @(); ForEach ($log in $logs) {if($log.instanceid -eq 7001) {$type = "Logon"} Elseif ($log.instanceid -eq
7002){$type="Logoff"} Else {Continue} $res += New-Object PSObject -Property @{Time = $log.TimeWritten;
"Event" = $type; User = (New-Object System.Security.Principal.SecurityIdentifier
$Log.ReplacementStrings[1]).Translate([System.Security.Principal.NTAccount])}};
$res
```

Get-WinEvent Examples

```
# Get user Logon / Logoff events
Get-WinEvent -FilterHashtable @{
    LogName='System'
    ProviderName='Microsoft-Windows-Winlogon'
    ID=7001,7002
}
```

```
Get-WinEvent -FilterHashtable @{
    LogName='Application'
    ProviderName='.NET Runtime'
    Keywords=36028797018963968
    ID=1023
    Level=2
}
```

Formatting output

Source

You can see what formatters are available on any system using the following command

```
Get-Command -Verb Format -Module Microsoft.PowerShell.Utility
```

Below is the output on Windows 11 as of 10/31/2023

```
PS C:\> Get-Command -Verb Format -Module Microsoft.PowerShell.Utility
```

CommandType	Name	Version	Source
-----	----	-----	-----
Function	Format-Hex	3.1.0.0	Microsoft.PowerShell.Utility
Cmdlet	Format-Custom	3.1.0.0	Microsoft.PowerShell.Utility
Cmdlet	Format-List	3.1.0.0	Microsoft.PowerShell.Utility
Cmdlet	Format-Table	3.1.0.0	Microsoft.PowerShell.Utility
Cmdlet	Format-Wide	3.1.0.0	Microsoft.PowerShell.Utility

You also have access to the following cmdlets for other output formats

Export-CliXml

```
# Export-Clixml exports an XML representation of an object or objects and stores it in a file
Get-Acl C:\Windows | Export-CliXml -Path .\c-windows-acl.xml
```

```
# You can use Import-CliXml to save the stored object or objects back to a variable
$WindowsFolderACL = Import-CliXml -Path .\c-windows-acl.xml
```

Export-Csv

```
# Export-Csv - Add an example later
```

Redirecting data with Out-* cmdlets

Source

```
Out-Host -Paging
```

```
Get-Process | Out-Host -Paging | Format-List
```

```
Get-Process | Format-List | Out-Host -Paging
```

```
Get-Command | Out-Null
```

```
Get-Command Get-Command | Out-Printer -Name 'Microsoft Office Document Image Writer'
```

```
Get-Process | Out-File -FilePath C:\temp\processlist.txt
```

```
Get-Command | Out-File -FilePath c:\temp\output.txt -Width 2147483647
```

```
Get-EventLog -LogName System -After (Get-Date).AddDays(-1) -EntryType Error | Out-GridView
```

Grouping output

Remember to use the Get-Member cmdlet to see what properties you can use with Sort-Object and -GroupBy

```
Get-Service -Name win* | Sort-Object StartType | Format-Table -GroupBy StartType -AutoSize
```

```
PS C:\> Get-Service -Name win* | Sort-Object StartType | Format-Table -GroupBy StartType -AutoSize
```

StartType: Automatic

Status	Name	DisplayName
--------	------	-------------

Running	Winmgmt	Windows Management Instrumentation
---------	---------	------------------------------------

Running	WinDefend	Microsoft Defender Antivirus Service
---------	-----------	--------------------------------------

StartType: Manual

Status	Name	DisplayName
--------	------	-------------

Stopped	WinRM	Windows Remote Management (WS-Management)
---------	-------	---

Running	WinHttpAutoProxySvc	WinHTTP Web Proxy Auto-Discovery Service
---------	---------------------	--

Querying for specific logs

System uptime related logs

For the actual current system uptime via PowerShell, [look here](#).

Use this XML Filter in the Windows Event Viewer to create a custom filtered view of Kernel-General "The operating system started at system time..." events.

```
<QueryList>
  <Query Id="0" Path="System">
    <Select Path="System">*[System[(EventID='12')]]</Select>
    <Select Path="System">*[System[(EventID='13')]]</Select>
  </Query>
</QueryList>
```

Actual log message

Log Name: System

Source: Microsoft-Windows-Kernel-General

Date: 5/30/2023 7:48:33 PM

Event ID: 12

Task Category: (1)

Level: Information

Keywords: (128)

User: SYSTEM

Computer: [REDACTED]

Description:

The operating system started at system time 2023-05-31T02:48:32.500000000Z.

Event Xml:

```
<Event xmlns="http://schemas.microsoft.com/win/2004/08/events/event">
  <System>
    <Provider Name="Microsoft-Windows-Kernel-General" Guid="{a68ca8b7-004f-d7b6-a698-07e2de0f1f5d}" />
    <EventID>12</EventID>
    <Version>0</Version>
    <Level>4</Level>
    <Task>1</Task>
    <Opcode>0</Opcode>
    <Keywords>0x8000000000000080</Keywords>
    <TimeCreated SystemTime="2023-05-31T02:48:33.1346923Z" />
    <EventRecordID>74715</EventRecordID>
    <Correlation />
    <Execution ProcessID="4" ThreadID="8" />
    <Channel>System</Channel>
    <Computer>[REDACTED]</Computer>
    <Security UserID="S-1-5-18" />
  </System>
  <EventData>
    <Data Name="MajorVersion">10</Data>
    <Data Name="MinorVersion">0</Data>
    <Data Name="BuildVersion">19041</Data>
    <Data Name="QfeVersion">2075</Data>
    <Data Name="ServiceVersion">0</Data>
    <Data Name="BootMode">0</Data>
    <Data Name="StartTime">2023-05-31T02:48:32.5000000Z</Data>
  </EventData>
</Event>
```

Finding account lockouts.

XML Query

Use this XML Filter in the Windows Event Viewer to create a custom filtered view displaying account lockouts.

```
<QueryList>
  <Query Id="0" Path="Security">
    <Select Path="Security">
      *
      System[(EventID='4740')]
    </Select>
  </Query>
</QueryList>
```

PowerShell Script - Slow method

```
Get-EventLog -LogName Security | Where-Object {$_.EventID -eq 4740} |
  Select-Object -Property TimeGenerated, Source, EventID, InstanceID, Message
```

PowerShell Script - Fast method

```
$query = @"
<QueryList>
  <Query Id="0" Path="Security">
    <Select Path="Security">
      *
      System[(EventID='4740')]
    </Select>
  </Query>
</QueryList>
"@

Get-WinEvent -FilterXml $query | Format-List
```

Finding account lockouts for a particular user.

XML Query

Use this XML Filter in the Windows Event Viewer to create a custom filtered view displaying account lockouts for the administrator user.

```
<QueryList>
  <Query Id="0" Path="Security">
    <Select Path="Security">
      *
      [
        EventData[Data[@Name='TargetUserName']='administrator']
        and
        System[(EventID='4740')]
      ]
    </Select>
  </Query>
</QueryList>
```

PowerShell Script - Fast method

```
$query = @"
<QueryList>
  <Query Id="0" Path="Security">
    <Select Path="Security">
      *
      [
        EventData[Data[@Name='TargetUserName']='administrator']
        and
        System[(EventID='4740')]
      ]
    </Select>
  </Query>
</QueryList>
"@

Get-WinEvent -FilterXml $query | Format-List
```

NPS + Azure MFA Logs - XML Query

XML Filter for custom filtered view that suppresses accounting event logs.

```

<QueryXML>
  <QueryList>
    <Query Id="0" Path="System">
      <Select Path="System">*[System[Provider[@Name='NPS']]]</Select>
      <Select Path="Security">*[System[Provider[@Name='Microsoft-Windows-Security-Auditing'] and Task = 12552]]</Select>
      <Suppress Path="Security">*[System[Provider[@Name='Microsoft-Windows-Security-Auditing'] and Task = 12552 and (Data='Network Policy Server discarded the accounting request for a user.')]</Suppress>
      <Select Path="Security">*[System[Provider[@Name='Microsoft-Windows-Security-Auditing']]] and *[EventData[Data[@Name='LogonProcessName'] and (Data='IAS')]]</Select>
      <Select Path="AuthNOptCh">*</Select>
      <Select Path="AuthZAdminCh">*</Select>
      <Select Path="AuthZOptCh">*</Select>
    </Query>
  </QueryList>
</QueryXML>

```

NPS Logs - XML Query

XML Filter for custom filtered view that suppresses accounting event logs.

```

<QueryXML>
  <QueryList>
    <Query Id="0" Path="System">
      <Select Path="System">*[System[Provider[@Name='NPS']]]</Select>
      <Select Path="Security">*[System[Provider[@Name='Microsoft-Windows-Security-Auditing'] and Task = 12552]]</Select>
      <Suppress Path="Security">*[System[Provider[@Name='Microsoft-Windows-Security-Auditing'] and Task = 12552 and (Data='Network Policy Server discarded the accounting request for a user.')]</Suppress>
      <Select Path="Security">*[System[Provider[@Name='Microsoft-Windows-Security-Auditing']]] and *[EventData[Data[@Name='LogonProcessName'] and (Data='IAS')]]</Select>
    </Query>
  </QueryList>
</QueryXML>

```

Disk logs

XML Query

XML Filter for custom filtered view for disk events.

```
<QueryList>
  <Query Id="0" Path="System">
    <Select Path="System">*[System[Provider[@Name='disk']]]</Select>
  </Query>
</QueryList>
```

VPN Client Logs

PowerShell Query

```
$query = @"
<QueryList>
  <Query Id="0" Path="Application">
    <Select Path="Application">*[System[Provider[@Name='RasAuto' or @Name='RasCfg' or
@Name='RasClient' or @Name='Rasman' or @Name='Microsoft-Windows-RasServer' or @Name='Microsoft-
Windows-RasSstp' or @Name='Microsoft-Windows-EapMethods-RasChap' or @Name='Microsoft-Windows-
NcdAutoSetup' or @Name='Microsoft-Windows-NCSI' or @Name='Microsoft-Windows-
NetworkProfile']]]</Select>
    <Select Path="System">*[System[Provider[@Name='RasAuto' or @Name='RasCfg' or @Name='RasClient' or
@Name='Rasman' or @Name='Microsoft-Windows-RasServer' or @Name='Microsoft-Windows-RasSstp' or
@Name='Microsoft-Windows-EapMethods-RasChap' or @Name='Microsoft-Windows-NcdAutoSetup' or
@Name='Microsoft-Windows-NCSI' or @Name='Microsoft-Windows-NetworkProfile']]]</Select>
  </Query>
</QueryList>
"@

$vpnEvents = Get-WinEvent -FilterXml $query -Oldest

# Displays events from the last 24 hours grouped by ProviderName
# This is the best view for easily browsing
$vpnEvents | ?{$_ .TimeCreated -ge (Get-Date).Addhours(-24)}
```

```
# Displays events from the last 24 hours as a time sorted list
$vpnEvents | ?{$_ .TimeCreated -ge (Get-Date).Addhours(-24)} | Format-List
```

XML Query

```
<QueryList>
  <Query Id="0" Path="Application">
    <Select Path="Application">*[System[Provider[@Name='RasAuto' or @Name='RasCfg' or
@Name='RasClient' or @Name='Rasman' or @Name='Microsoft-Windows-RasServer' or @Name='Microsoft-
Windows-RasSstp' or @Name='Microsoft-Windows-EapMethods-RasChap' or @Name='Microsoft-Windows-
NcdAutoSetup' or @Name='Microsoft-Windows-NCSI' or @Name='Microsoft-Windows-
NetworkProfile']]]</Select>
    <Select Path="System">*[System[Provider[@Name='RasAuto' or @Name='RasCfg' or @Name='RasClient' or
@Name='Rasman' or @Name='Microsoft-Windows-RasServer' or @Name='Microsoft-Windows-RasSstp' or
@Name='Microsoft-Windows-EapMethods-RasChap' or @Name='Microsoft-Windows-NcdAutoSetup' or
@Name='Microsoft-Windows-NCSI' or @Name='Microsoft-Windows-NetworkProfile']]]</Select>
  </Query>
</QueryList>
```

Searching for Wired/WLAN-AutoConfig related errors

[Original source](#)

Wired-AutoConfig

```
#Powershell
$addhours = 12;

# Setup filter for error only logs
$filter = @{ LogName = "Microsoft-Windows-Wired-AutoConfig/Operational"
StartTime = [DateTime]::Now.AddHours($addhours*-1)
EndTime = [DateTime]::Now
Level = 2
}

Write-Host ([DateTime]::Now.AddHours($addhours*-1))

Write-Host ([DateTime]::Now)

$Events = Get-Winevent -FilterHashtable $filter
```

```
# Parse out the event message data
ForEach ($Event in $Events) {
    # Convert the event to XML
    $eventXML = [xml]$Event.ToXml()
    # Iterate through each one of the XML message properties
    For ($i=0; $i -lt $eventXML.Event.EventData.Data.Count; $i++) {
        # Append these as object properties
        Add-Member -InputObject $Event -MemberType NoteProperty -Force -Name
        $eventXML.Event.EventData.Data[$i].name -Value $eventXML.Event.EventData.Data[$i].'#text'
    }
}
```

```
# Show results stored in variable
$Events | Format-List
```

WLAN-AutoConfig

```
#Powershell
$addhours = 12;

# Setup filter for error only logs
$filter = @{ LogName = "Microsoft-Windows-WLAN-AutoConfig/Operational"
StartTime = [DateTime]::Now.AddHours($addhours*-1)
EndTime = [DateTime]::Now
Level = 2
}

Write-Host ([DateTime]::Now.AddHours($addhours*-1))

Write-Host ([DateTime]::Now)

$Events = Get-Winevent -FilterHashtable $filter
```

```
# Parse out the event message data
ForEach ($Event in $Events) {
    # Convert the event to XML
    $eventXML = [xml]$Event.ToXml()
    # Iterate through each one of the XML message properties
    For ($i=0; $i -lt $eventXML.Event.EventData.Data.Count; $i++) {
        # Append these as object properties
        Add-Member -InputObject $Event -MemberType NoteProperty -Force -Name
        $eventXML.Event.EventData.Data[$i].name -Value $eventXML.Event.EventData.Data[$i].'#text'
    }
}

$Events | Select-Object id, MachineName, ProcessId, TimeCreated, Adapter, LocalMac, SSID, Cipher, Auth,
PeerMac | Format-List
```

```
# Show results stored in variable
$Events | Select-Object id, MachineName, ProcessId, TimeCreated, Adapter, LocalMac, SSID, Cipher, Auth,
PeerMac | Format-List
```

Show available wireless profiles and available wireless networks

```
# show profiles
netsh wlan show profiles

# show available networks
netsh wlan show networks
```

Duo Security Events

```
# Get Duo Security related events
Get-WinEvent -FilterHashtable @{
    LogName='Application'
    ProviderName='Duo Security'
```

}

Sources: [1](#)

Useful PowerShell Commands

Placeholder

Select-String is the Grep equivalent

Examples:

```
# Searching for multiple patterns at the same time
Select-String -Path "*.txt" -Pattern "Pattern1","Pattern2","Pattern3"

# Only return the first 10 results
Select-String -Path "*.txt" -Pattern "Pattern1","Pattern2","Pattern3" | Select-Object -First 10

# Searching for IP addresses
Select-String -Path "*.log" -Pattern '\b\d{1,3}\.\d{1,3}\.\d{1,3}\.\d{1,3}\b' | Select-Object -First 10
```

Uptime

The script below will give you the uptime in any version of PowerShell.

```
Get-CimInstance -ClassName Win32_OperatingSystem | Select LastBootUpTime
```

The [Get-Uptime](#) cmdlet was introduced in PowerShell 6.0.

```
Get-Uptime
```

Format processes by start date

This command will show a lot of errors if you're not running PowerShell as Administrator.

Active Directory Account Information

This command will show you the date of the last password set for a user.

```
Get-ADUser -Identity [USERNAME] -properties * | select accountexpirationdate, accountexpires,  
accountlockouttime, badlogoncount, padpwdcount, lastbadpasswordattempt, lastlogondate, lockedout,  
passwordexpired, passwordlastset, pwdlastset | format-list
```

Sources:

[PowerShell Format-Table](#)

Active Directory Account Password Expiration

The old way:

```
net use userName /domain
```

The PowerShell way:

```
Get-ADUser -identity userName -Properties "DisplayName", "msDS-UserPasswordExpiryTimeComputed" |  
Select-Object -Property  
"Displayname", @{Name="ExpiryDate"; Expression={[datetime]::FromFileTime($_.msDS-  
UserPasswordExpiryTimeComputed)}}}
```

Active Directory OU Account Password Expiration

```
Get-ADUser -filter * -SearchBase "OU=Management,OU=ADPRO Users,DC=ad,DC=activedirectorypro,DC=com"  
-Properties "DisplayName", "msDS-UserPasswordExpiryTimeComputed" | Select-Object -Property
```

```
"Displayname",@{Name="ExpiryDate";Expression={[datetime]::FromFileTime($_.msDS-UserPasswordExpiryTimeComputed)}}}
```

View physical network interfaces

```
# Show all physical devices
```

```
Get-NetAdapter -Physical | Sort-Object -Property MediaType,Name | Format-Table  
ifIndex,MediaType,InterfaceMetric,Name,InterfaceDescription,Status,MacAddress,LinkSpeed
```

Get interface metrics

```
# IPv4 - Display interfaces sorted by metric and alias
```

```
Get-NetIPInterface -AddressFamily IPv4 | Sort InterfaceMetric,InterfaceAlias
```

```
# IPv6 - Display interfaces sorted by metric and alias
```

```
Get-NetIPInterface -AddressFamily IPv6 | Sort InterfaceMetric,InterfaceAlias
```

```
# All - Display interfaces sorted by metric and alias
```

```
Get-NetIPInterface | Sort InterfaceMetric,InterfaceAlias
```

Set interface metrics

The following commands will set Ethernet interfaces to be preferred over wireless interfaces by manipulating the InterfaceMetric of each device. If there are more than one Ethernet and/or Wireless interface on the machine, you may want to adjust these metrics further to provide a more detailed use order.

```
# Set Ethernet devices interface metric to 11
```

```
Get-NetAdapter -Physical | Where {$_.MediaType -eq "802.3"} | Set-NetIPInterface -InterfaceMetric 11
```

```
# Set Wireless devices interface metric to 12
```

```
Get-NetAdapter -Physical | Where {$_.MediaType -eq "Native 802.11"} | Set-NetIPInterface -InterfaceMetric 12
```

Is your Office installation 32 or 64 bit?

```
# .platform value will be either x86 for 32-bit or x64 for 64-bit
$officeCheck = (Get-ItemProperty -Path "HKLM:\SOFTWARE\Microsoft\Office\ClickToRun\Configuration").platform

if ($officeCheck -eq 'x64'){
    Write-Output "Office is 64 bit."
}
else {
    Write-Output "Office is 32 bit."
}
```

Windows Network Management from the command line

Get interface metrics

```
# IPv4 - Display interfaces sorted by metric and alias
```

```
Get-NetIPInterface -AddressFamily IPv4 | Sort InterfaceMetric,InterfaceAlias
```

```
# IPv6 - Display interfaces sorted by metric and alias
```

```
Get-NetIPInterface -AddressFamily IPv6 | Sort InterfaceMetric,InterfaceAlias
```

```
# All - Display interfaces sorted by metric and alias
```

```
Get-NetIPInterface | Sort InterfaceMetric,InterfaceAlias
```

Set interface metrics

The following commands will set Ethernet interfaces to be preferred over wireless interfaces by manipulating the InterfaceMetric of each device. If there are more than one Ethernet and/or Wireless interface on the machine, you may want to adjust these metrics further to provide a more detailed use order.

```
# Set Ethernet devices interface metric to 11
```

```
Get-NetAdapter -Physical | Where {$_.MediaType -eq "802.3"} | Set-NetIPInterface -InterfaceMetric 11
```

```
# Set Wireless devices interface metric to 12
```

```
Get-NetAdapter -Physical | Where {$_.MediaType -eq "Native 802.11"} | Set-NetIPInterface -InterfaceMetric 12
```

netsh and firewall

```
# turn off Windows firewall for all profiles
```

```
netsh advfirewall set allprofiles state off
```

netsh wireless

```
# show wireless LAN interfaces on the system
```

```
netsh wlan show interfaces
```

```
# show properties of the wireless LAN drivers on the system
```

```
netsh wlan show drivers
```

```
# show list of networks visible on the system
```

```
netsh wlan show networks
```

```
# show more detailed information on visible networks
```

```
netsh wlan show networks mode=bssid
```

```
# show a list of profiles configured on the system
```

```
netsh wlan show profiles
```

```
# connect to an SSID using a Profile
```

```
netsh wlan connect ssid=[ssid] name=[profile]
```

```
# disconnect all wireless interfaces
netsh wlan disconnect
```

Setting IPv4 address using netsh

```
netsh interface ipv4 show config
```

```
# set IPv4 address and dns on an interface using dhcp
```

```
netsh interface ipv4 set address name="Ethernet" source=dhcp
```

```
netsh interface ipv4 set dns name="Ethernet" source=dhcp
```

```
# set IPv4 address on an interface
```

```
netsh interface ipv4 set address name="Ethernet" static 10.1.1.84 255.255.255.0 10.1.1.1
```

```
# set DNS servers on an interface
```

```
netsh interface ipv4 set dns name="Ethernet" static 8.8.8.8 1.1.1.1
```

```
#end
```