

# T1016 - System Network Configuration Discovery

### **Description from ATT&CK**

Adversaries may look for details about the network configuration and settings, such as IP and/or MAC addresses, of systems they access or through information discovery of remote systems. Several operating system administration utilities exist that can be used to gather this information. Examples include [Arp]

(https://attack.mitre.org/software/S0099), [ipconfig]

(https://attack.mitre.org/software/S0100)/[ifconfig]

(https://attack.mitre.org/software/S0101), [nbtstat]

(https://attack.mitre.org/software/S0102), and [route]

(https://attack.mitre.org/software/S0103).

Adversaries may also leverage a <u>Network Device CLI</u> on network devices to gather information about configurations and settings, such as IP addresses of configured interfaces and static/dynamic routes (e.g. show ip route, show ip interface). (Citation: US-CERT-TA18-106A)(Citation: Mandiant APT41 Global Intrusion)

Adversaries may use the information from <u>System Network Configuration Discovery</u> during automated discovery to shape follow-on behaviors, including determining certain access within the target network and what actions to do next.

# **Atomic Tests**

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# Atomic Test #1 - System Network Configuration Discovery on Windows

Identify network configuration information

Upon successful execution, cmd.exe will spawn multiple commands to list network configuration settings. Output will be via stdout.

Supported Platforms: Windows

auto\_generated\_guid: 970ab6a1-0157-4f3f-9a73-ec4166754b23

Attack Commands: Run with command\_prompt!

```
ipconfig /all
netsh interface show interface
arp -a
nbtstat -n
net config
```

### **Atomic Test #2 - List Windows Firewall Rules**

Enumerates Windows Firewall Rules using netsh.

Upon successful execution, cmd.exe will spawn netsh.exe to list firewall rules. Output will be via stdout.

Supported Platforms: Windows

auto\_generated\_guid: 038263cb-00f4-4b0a-98ae-0696c67e1752

Attack Commands: Run with command\_prompt!

```
netsh advfirewall firewall show rule name=all
```

# Atomic Test #3 - System Network Configuration Discovery

Identify network configuration information.

Upon successful execution, sh will spawn multiple commands and output will be via stdout.

Supported Platforms: macOS, Linux

auto\_generated\_guid: c141bbdb-7fca-4254-9fd6-f47e79447e17

Attack Commands: Run with sh!

```
if [ -x "$(command -v arp)" ]; then arp -a; else echo "arp is missing froif [ -x "$(command -v ifconfig)" ]; then ifconfig; else echo "ifconfig i if [ -x "$(command -v ip)" ]; then ip addr; else echo "ip is missing froif [ -x "$(command -v netstat)" ]; then netstat -ant | awk '{print $NF}'
```

Dependencies: Run with sh!

Description: Check if arp command exists on the machine

**Check Prereq Commands:** 

```
Q
if [ -x "$(command -v arp)" ]; then exit 0; else exit 1; fi;
```

#### **Get Prereq Commands:**

```
(which yum \&\& yum -y install net-tools)|\cdot|(which apt-get \&\& DEBIAN_FRONTE: \Box
```

# **Atomic Test #4 - System Network Configuration Discovery** (TrickBot Style)

Identify network configuration information as seen by Trickbot and described here https://www.sneakymonkey.net/2019/10/29/trickbot-analysis-part-ii/

Upon successful execution, cmd.exe will spawn ipconfig /all, net config workstation, net view /all /domain, nltest /domain\_trusts. Output will be via stdout.

Supported Platforms: Windows

auto\_generated\_guid: dafaf052-5508-402d-bf77-51e0700c02e2

Attack Commands: Run with command\_prompt!

```
Q
ipconfig /all
net config workstation
net view /all /domain
nltest /domain_trusts
```

# Atomic Test #5 - List Open Egress Ports

This is to test for what ports are open outbound. The technique used was taken from the following blog: https://www.blackhillsinfosec.com/poking-holes-in-the-firewall-egresstesting-with-allports-exposed/

Upon successful execution, powershell will read top-128.txt (ports) and contact each port to confirm if open or not. Output will be to Desktop\open-ports.txt.

**Supported Platforms:** Windows

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#### Inputs:

Name	Description	Туре	Default Value
output_file	Path of file to write port scan results	path	\$env:USERPROFILE\Desktop\open-ports.txt
portfile_url	URL to top- 128.txt	url	https://github.com/redcanaryco/atomic- red- team/raw/master/atomics/T1016/src/top- 128.txt
port_file	The path to a text file containing ports to be	path	PathToAtomicsFolder\T1016\src\top-128.txt

scanned, one port per line. The default list	
uses the top	
128 ports as defined by	
Nmap.	

#### Attack Commands: Run with powershell!

```
Q
$ports = Get-content "#{port_file}"
$file = "#{output_file}"
$totalopen = 0
$totalports = 0
New-Item $file -Force
foreach ($port in $ports) {
    $test = new-object system.Net.Sockets.TcpClient
    $wait = $test.beginConnect("allports.exposed", $port, $null, $null)
    $wait.asyncwaithandle.waitone(250, $false) | Out-Null
    $totalports++ | Out-Null
    if ($test.Connected) {
        $result = "$port open"
        Write-Host -ForegroundColor Green $result
        $result | Out-File -Encoding ASCII -append $file
        $totalopen++ | Out-Null
    }
    else {
        $result = "$port closed"
        Write-Host -ForegroundColor Red $result
        $totalclosed++ | Out-Null
        $result | Out-File -Encoding ASCII -append $file
    }
$results = "There were a total of $totalopen open ports out of $totalpor"
$results | Out-File -Encoding ASCII -append $file
Write-Host $results
```

#### Cleanup Commands:

```
Remove-Item -ErrorAction ignore "#{output_file}"
```

#### Dependencies: Run with powershell!

Description: Test requires #{port\_file} to exist

**Check Prereq Commands:** 

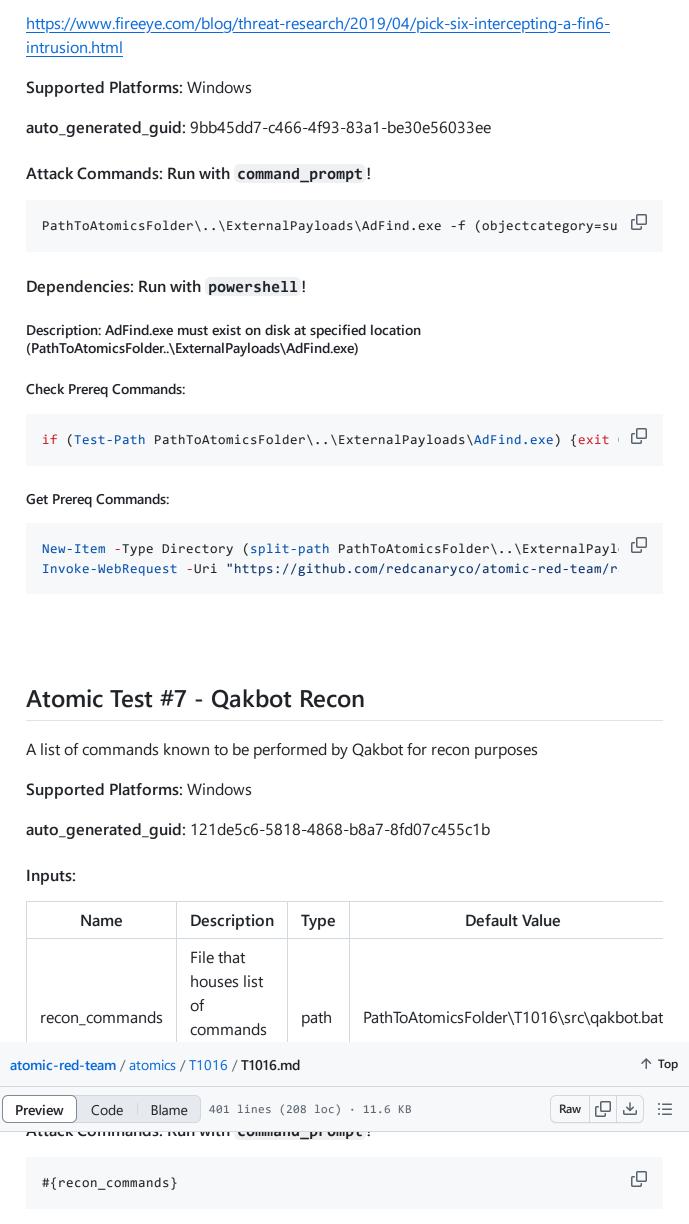
```
if (Test-Path "#{port_file}") {exit 0} else {exit 1}
```

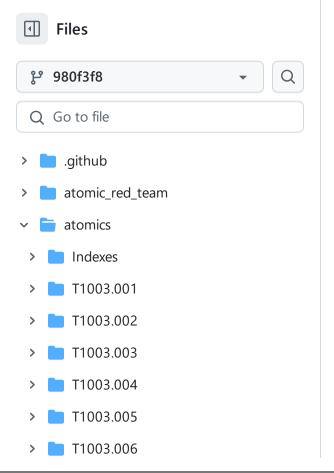
#### Get Prereq Commands:

```
New-Item -Type Directory (split-path "#{port_file}") -ErrorAction ignore Invoke-WebRequest "#{portfile_url}" -OutFile "#{port_file}"
```

# Atomic Test #6 - Adfind - Enumerate Active Directory Subnet Objects

Adfind tool can be used for reconnaissance in an Active directory environment. This example has been documented by ransomware actors enumerating Active Directory Subnet Objects reference- http://www.joeware.net/freetools/tools/adfind/,





```
T1003.007
  T1003.008
 T1003
 T1006
 T1007
 T1010
 T1012
 T1014
T1016
> src
  T1016.md
  T1016.yaml
 T1018
 T1020
  T1021.001
 T1021.002
 T1021.003
 T1021.005
 T1021.006
 T1027.001
 T1027.002
 T1027.004
 T1027.006
 T1027
 T1030
 T1033
  T1036.003
  T1036.004
  T1036.005
  T1036.006
```

T1036

T1037.001

```
New-Item -Type Directory (split-path #{recon_commands}) -ErrorAction ign □
Invoke-WebRequest "https://github.com/redcanaryco/atomic-red-team/raw/ma
```

#### Atomic Test #8 - List macOS Firewall Rules

"This will test if the macOS firewall is enabled and/or show what rules are configured. Must be run with elevated privileges. Upon successful execution, these commands will output various information about the firewall configuration, including status and specific port/protocol blocks or allows.

Using defaults, additional arguments can be added to see filtered details, such as globalstate for global configuration ("Is it on or off?"), firewall for common application allow rules, and explicitanths for specific rules configured by the user.

Using socketfilterfw, flags such as --getglobalstate or --listapps can be used for similar filtering. At least one flag is required to send parseable output to standard out.

Supported Platforms: macOS

auto\_generated\_guid: ff1d8c25-2aa4-4f18-a425-fede4a41ee88

Attack Commands: Run with bash! Elevation Required (e.g. root or admin)

```
sudo defaults read /Library/Preferences/com.apple.alf
sudo /usr/libexec/ApplicationFirewall/socketfilterfw --getglobalstate
```

# Atomic Test #9 - DNS Server Discovery Using nslookup

Identify System domain dns controller on an endpoint using nslookup Idap query. This tool is being abused by qakbot malware to gather information on the domain controller of the targeted or compromised host. reference https://securelist.com/qakbot-technicalanalysis/103931/

Supported Platforms: Windows

auto\_generated\_guid: 34557863-344a-468f-808b-a1bfb89b4fa9

Attack Commands: Run with command\_prompt!

```
nslookup -querytype=ALL -timeout=12 _ldap._tcp.dc._msdcs.%USERDNSDOMAIN% ☐
```

Q