INTERNSHIP REPORT

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Attack and Breach Simulation Framework

Organization: BhumiiTech Pvt. Ltd.

Internship Duration: 1 month

Date: 15 May 2023- 15 June 2023

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Executive Summary

During my internship at BhumiiTech I have been actively involved in the development and implementation of an attack and simulation framework. My primary focus has been on studying and applying the MITRE ATT&CK framework and exploring the functionalities of the Atomic Red Team testing suite.

To begin, I conducted in-depth research on the MITRE ATT&CK framework, a comprehensive knowledge base of adversary tactics and techniques. I familiarized myself with its structure, sub-techniques, and the associated threat groups. This enabled me to understand the landscape of modern cyber threats and the various attack vectors used by adversaries. Building upon my knowledge of the MITRE ATT&CK framework, I delved into the Atomic Red Team project, an open-source testing suite designed to validate the effectiveness of security controls and identify potential weaknesses in an organization's defences. I thoroughly studied the documentation, including the available test cases and methodologies, to gain a solid understanding of how to simulate different attack techniques.

In order to gain practical experience, I successfully installed the Atomic Red Team framework on my Windows and kali Linux desktop machine. This involved setting up the necessary dependencies, configuring the environment, and ensuring compatibility with the target operating system. By doing so, I gained hands-on experience in utilizing the framework and executing simulated attacks within a controlled environment. Throughout this process, I documented my findings, observations, and any challenges encountered during the installation and usage of the Atomic Red Team framework. I also noted potential improvements and recommendations for optimizing its usability and functionality.

Research Description

1. Study the MITRE ATT&CK Framework so that the various TTPs can be well understood.

2. Install Atomic Red Team in systems Virtual Machine

3. Understand the functionality of the complete framework and demonstration of the same.

4. Throughout the project, effective documentation and reporting was maintained. To ensure clear communication and tracking of progress and also serve as valuable references for future analysis and improvement.

5. The report presented includes comprehensive information about the research conducted, scenario design, scenario development, proof of concept (POC), detailed network infrastructure, and mitigation strategies. And also provided the documentation of the findings, observations, adjustments made, and recommendations for each phase.

6. By adhering to a consistent reporting format and preparing detailed reports showcased the understanding and expertise and also created a valuable knowledge base for future reference and continuous improvement in the field of cybersecurity Red Teaming.

Methodology

1. Selection of Atomic Red Team Framework:

- Thoroughly researched and reviewed the Atomic Red Team framework, understanding its purpose, objectives, and capabilities.
- Assessed the compatibility of the framework with the organization's environment and security goals.

2. Planning and Objective Setting:

- Collaborated with the team and supervisor to define the scope and objectives of the internship project.
- Established specific goals for implementing Atomic Red Team using Kali Linux Purple and Windows 11.

3. Setup of Testing Environment:

- Configured a dedicated testing environment, isolated from production systems, to safely conduct the Atomic Red Team testing.
- Deployed Kali Linux Purple and Windows 11 virtual machines on separate hardware resources.

4. Identification of Security Controls:

- Collaborated with the organization's security team to identify the security controls to be tested.
- Conducted a thorough review of the existing security infrastructure, including antivirus, intrusion detection systems, firewall rules, and user access controls.

5. Selection and Customization of Atomic Tests:

- Explored the Atomic Red Team repository and identified a comprehensive set of Atomic Tests relevant to the identified security controls.

- Customized the Atomic Tests to align with the organization's specific environment, ensuring they targeted the intended systems and infrastructure.

6. Execution of Atomic Tests:

- Executed the adapted Atomic Tests on the testing environment, following proper guidelines and ethical considerations.
- Monitored and documented the results of each test, including successes, failures, and any unexpected behaviour.

7. Analysis and Evaluation:

- Analysed the outcomes of the Atomic Red Team testing, assessing the effectiveness of the security controls in detecting and mitigating the simulated attacks.
- Evaluated the performance of Kali Linux Purple and Windows 11 in executing the specific Atomic Tests, identifying any platform-specific vulnerabilities or limitations.

Implementation

Infrastructure Setup:

Installing Kali Linux Purple 2023.1 and Windows 11 VMs on VMware Workstation 17

Steps involved:

1. Download VMware Workstation 17: Visit the official VMware website and download the latest version of VMware Workstation 17 compatible with your operating system.

2. Obtain Kali Linux Purple and Windows 11 ISOs: Download the ISO images for Kali Linux Purple2023.1 and Windows 11 from their respective official websites or trusted sources.

3. Create a New Virtual Machine (VM): Open VMware Workstation and click on "Create a New Virtual Machine." Choose the "Typical" configuration option.

4. Select Guest Operating System: In the "Guest Operating System Installation" window, select the appropriate option based on the operating system being installed. For Kali Linux Purple, select "Linux" and choose the correct version. For Windows 11, select "Windows" and choose the appropriate version.

5. Choose the ISO Image: In the next window, browse and select the Kali Linux Purple ISO file you downloaded earlier. Click "Next."

6. Configure Virtual Machine: Provide a name for the VM, choose the location where it will be stored, and set the disk size. Follow the prompts to complete the configuration settings, such as the number of processors, memory allocation, and network settings.

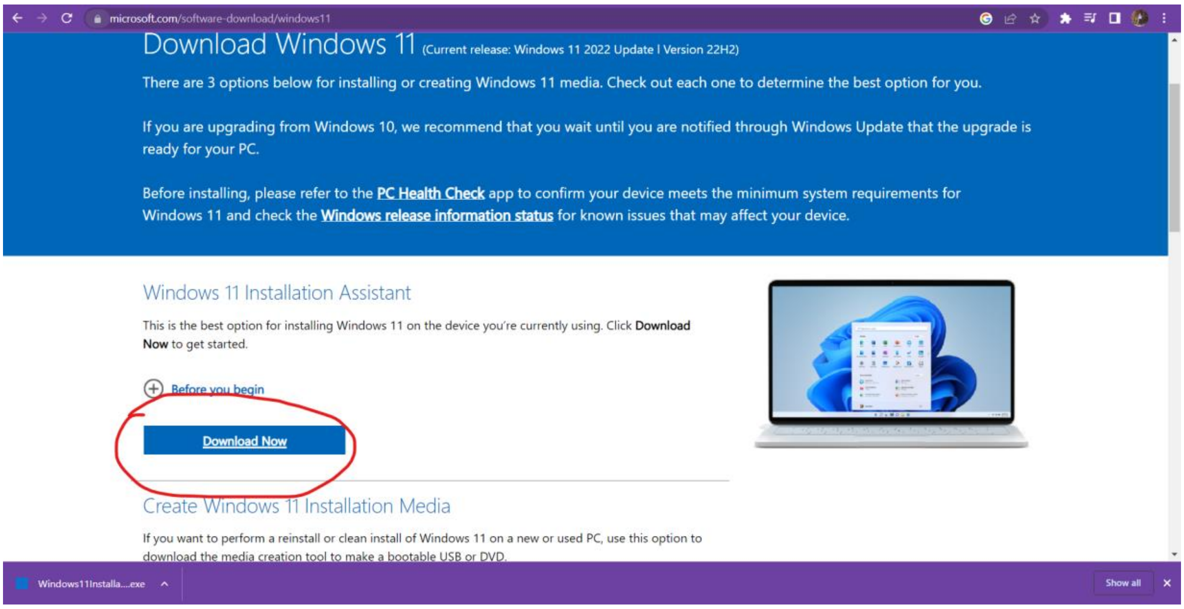
7. Customize Hardware: Review the hardware configuration and make any necessary adjustments. For example, increase the allocated RAM, enable virtualization extensions, or add additional virtual disks for storage. Ensure that the virtual network adapters are correctly configured.

8. Repeat Steps 3-7 for Windows 11: Create a new VM following the same steps mentioned above, but this time select the Windows 11 ISO file and configure the VM settings accordingly.

9. Start the VMs and Install the Operating Systems: Power on the Kali Linux Purple VM and follow the installation wizard to install the operating system. Repeat the process for the Windows 11 VM. Provide the required information during the installation process, such as the language, time zone, and account credentials.

10. Install VMware Tools: After the operating systems are installed, install VMware Tools on each VM to enhance the performance and functionality. In VMware Workstation, go to the "VM" menu, select "Install VMware Tools," and follow the on-screen instructions within each VM to complete the installation.

11. Customize and Configure: Customize the Kali Linux Purple and Windows 11 VMs based on your organization's requirements. This may include installing additional software, configuring network settings, and applying security updates.



Download Windows 11 (Current release: Windows 11 2022 Update l Version 22H2)

There are 3 options below for installing or creating Windows 11 media. Check out each one to determine the best option for you.

If you are upgrading from Windows 10, we recommend that you wait until you are notified through Windows Update that the upgrade is ready for your PC.

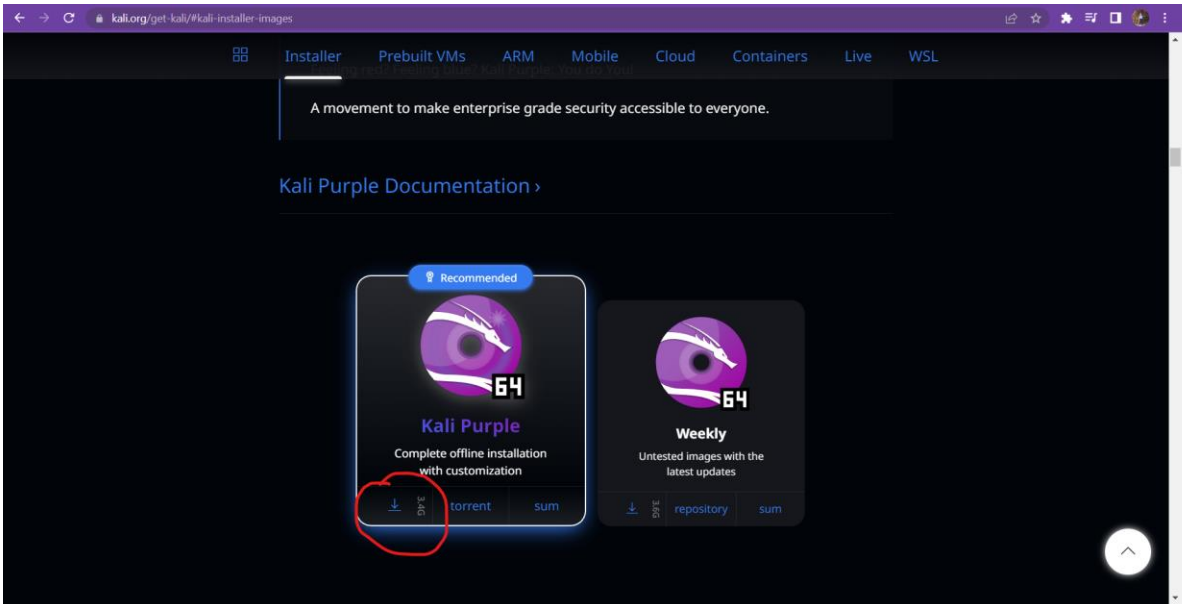
Before installing, please refer to the PC Health Check app to confirm your device meets the minimum system requirements for Windows 11 and check the Windows release information status for known issues that may affect your device.

Windows 11 Installation Assistant

This is the best option for installing Windows 11 on the device you're currently using. Click **Download Now** to get started.

Create Windows 11 Installation Media

If you want to perform a reinstall or clean install of Windows 11 on a new or used PC, use this option to download the media creation tool to make a bootable USB or DVD.

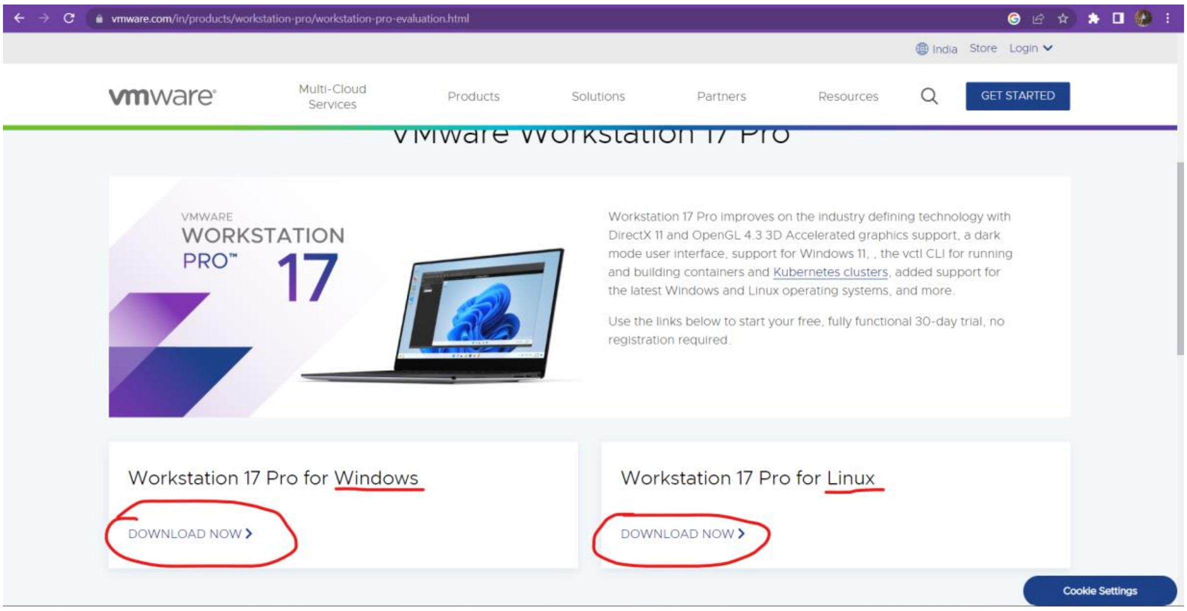


A movement to make enterprise grade security accessible to everyone.

Kali Purple Documentation ›

Complete offline installation with customization

Untested images with the latest updates



VMware Workstation 17 Pro

Workstation 17 Pro improves on the industry defining technology with DirectX 11 and OpenGL 4.3 3D Accelerated graphics support, a dark mode user interface, support for Windows 11, , the vctl CLI for running and building containers and Kubernetes clusters, added support for the latest Windows and Linux operating systems, and more.

Use the links below to start your free, fully functional 30-day trial, no registration required.

Workstation 17 Pro for Windows

Workstation 17 Pro for Linux

Why use two different Operating systems?

Diverse Testing Environments:

Kali Linux and Windows 11 represent two distinct operating system environments commonly found in real-world scenarios. By utilizing both, you can simulate a wider range of target systems, applications, and network configurations, enabling more realistic and comprehensive testing.

Compatibility with Target Systems:

Different organizations and industries may have varying system architectures, with some predominantly using Linux-based systems (such as servers) while others rely on Windows-based systems (such as workstations). By having both Kali Linux and Windows 11 in your testing arsenal, you can better align with the target systems you are assessing, ensuring a more accurate evaluation of their security controls.

Diverse Attack Techniques:

Atomic Red Team covers a broad spectrum of attack techniques, including those specific to Linux and Windows environments. By having both operating systems available, you can execute and evaluate a wider array of predefined tests and custom attack scenarios, providing a more thorough assessment of the organization's defences.

Validation of Cross-Platform Defence:

Organizations often employ multi-layered security defences that span both Linux and Windows systems. By utilizing Kali Linux and Windows 11, you can validate the effectiveness of these cross-platform defence mechanisms, such as network-based intrusion detection systems, firewalls, or endpoint protection solutions, ensuring they can detect and mitigate attacks across different operating systems.

Flexibility and Adaptability:

Different security testing scenarios may require specific tools or techniques that are more readily available on one operating system than the other. By utilizing both Kali Linux and Windows 11, you can leverage the strengths and capabilities of each operating system, ensuring flexibility and adaptability to various testing requirements.

Enhanced Skill Development:

Working with both Kali Linux and Windows 11 provides an opportunity for security professionals to develop proficiency in different operating systems and associated security tools. This expanded skill set enables a better understanding of diverse security landscapes and enhances their ability to identify vulnerabilities and mitigate risks effectively.

Installation of Atomic Red Team Framework:

Steps Involved:

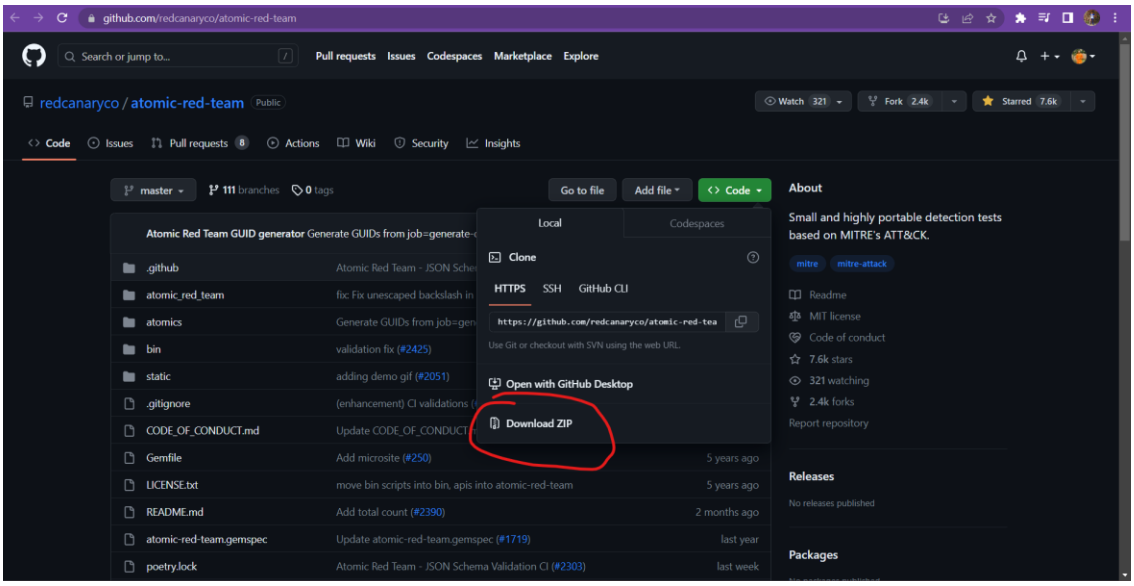
1. Prepare the Host System: Ensure that your host system meets the minimum requirements for running Atomic Red Team. This typically includes having a compatible operating system (such as Windows, Linux, or macOS) and sufficient resources like CPU, RAM, and disk space.

2. Install Dependencies: Before installing Atomic Red Team, ensure that all necessary dependencies are met. These dependencies may include programming languages (such as Python), libraries, frameworks, or specific tools required by Atomic Red Team. Refer to the official documentation or installation guide for the specific requirements.

3. Obtain Atomic Red Team: Download the Atomic Red Team framework from the official repository or trusted source. This can be obtained as a compressed archive or through a version control system like Git.

4. Extract the Archive: If you downloaded a compressed archive, extract its contents to a desired location on your host system. Use appropriate tools based on the archive format (e.g., tar, zip) to extract the files.

5. Configure Atomic Red Team: Navigate to the extracted directory and review the configuration options provided by Atomic Red Team. Modify the configuration files, if necessary, to customize the behaviour and settings according to your organization's requirements



Atomic Red Team GUID generator Generate GUIDs from job=generate-

.github	Atomic Red Team - JSON Sche	
atomic_red_team	fix: Fix unescaped backslash in	
atomics	Generate GUIDs from job=gen	
bin	validation fix (#2425)	
static	adding demo gif (#2051)	
.gitignore	(enhancement) CI validations (	
CODE_OF_CONDUCT.md	Update CODE_OF_CONDUCT	
Gemfile	Add microsite (#250)	5 years ago
LICENSE.txt	move bin scripts into bin, apis into atomic-red-team	5 years ago
README.md	Add total count (#2390)	2 months ago
atomic-red-team.gemspec	Update atomic-red-team.gemspec (#1719)	last year
poetry.lock	Atomic Red Team - JSON Schema Validation CI (#2303)	last week

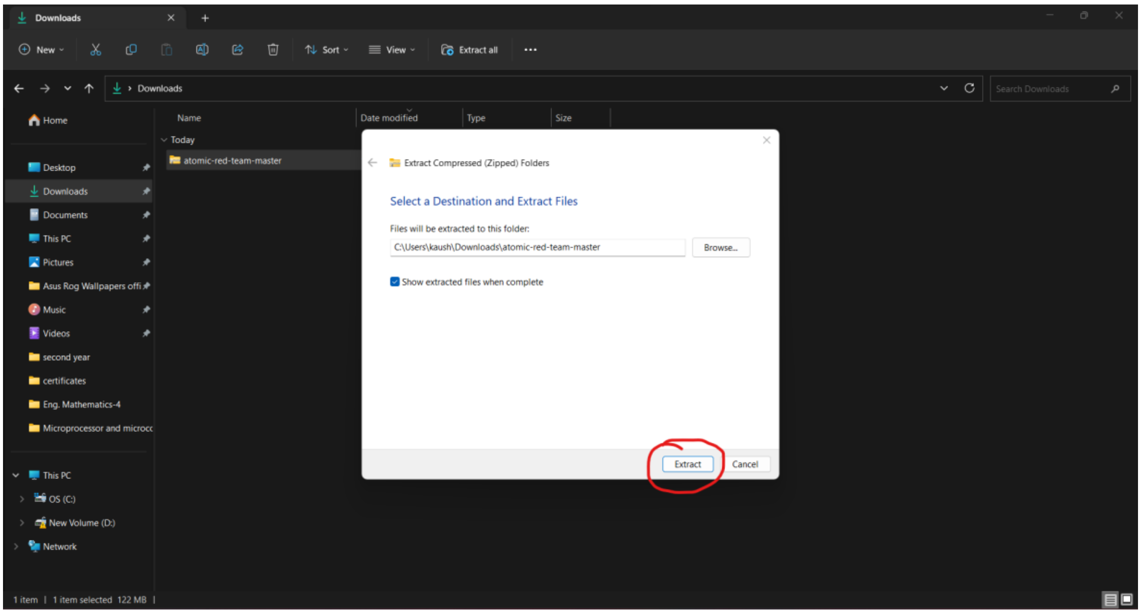
```
https://github.com/redcanaryco/atomic-red-tea
```

Use Git or checkout with SVN using the web URL.

About

Small and highly portable detection tests based on MITRE's ATT&CK.

mitre mitre-attack



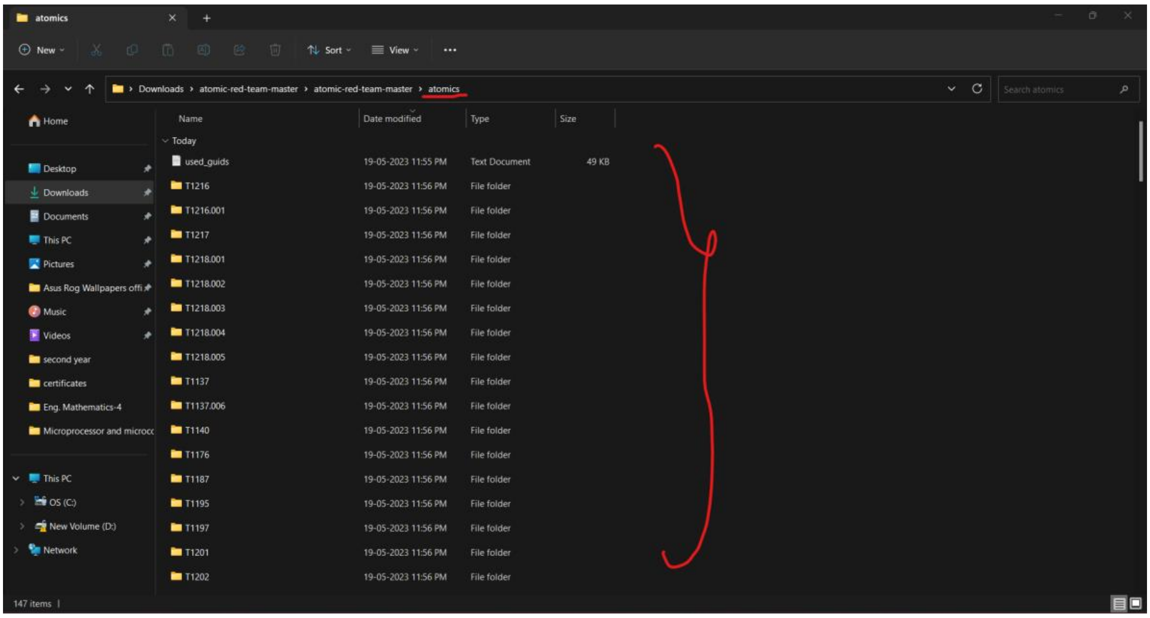
Extract Compressed (Zipped) Folders

Select a Destination and Extract Files

Files will be extracted to this folder:

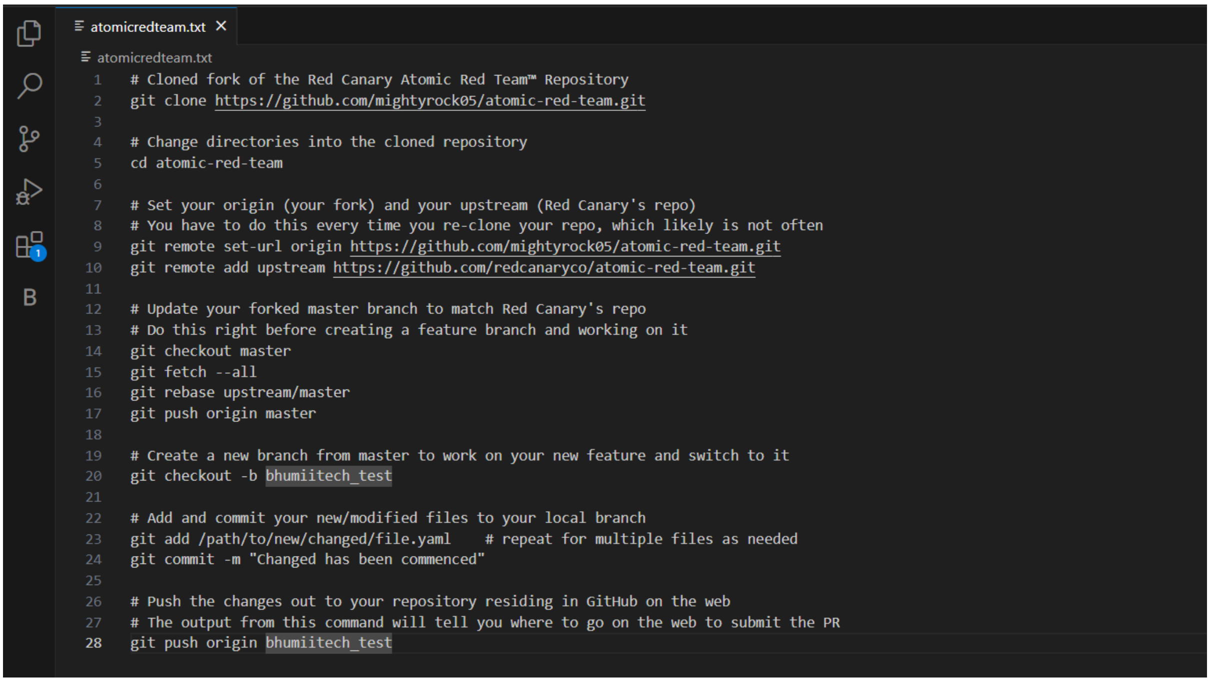
C:\Users\kaush\Downloads\atomic-red-team-master

☑ Show extracted files when complete



Name	Date modified	Type	Size
used_guids	19-05-2023 11:55 PM	Text Document	49 KB
T1216	19-05-2023 11:56 PM	File folder	
T1216.001	19-05-2023 11:56 PM	File folder	
T1217	19-05-2023 11:56 PM	File folder	
T1218.001	19-05-2023 11:56 PM	File folder	
T1218.002	19-05-2023 11:56 PM	File folder	
T1218.003	19-05-2023 11:56 PM	File folder	
T1218.004	19-05-2023 11:56 PM	File folder	
T1218.005	19-05-2023 11:56 PM	File folder	
T1137	19-05-2023 11:56 PM	File folder	
T1137.006	19-05-2023 11:56 PM	File folder	
T1140	19-05-2023 11:56 PM	File folder	
T1176	19-05-2023 11:56 PM	File folder	
T1187	19-05-2023 11:56 PM	File folder	
T1195	19-05-2023 11:56 PM	File folder	
T1197	19-05-2023 11:56 PM	File folder	
T1201	19-05-2023 11:56 PM	File folder	
T1202	19-05-2023 11:56 PM	File folder	

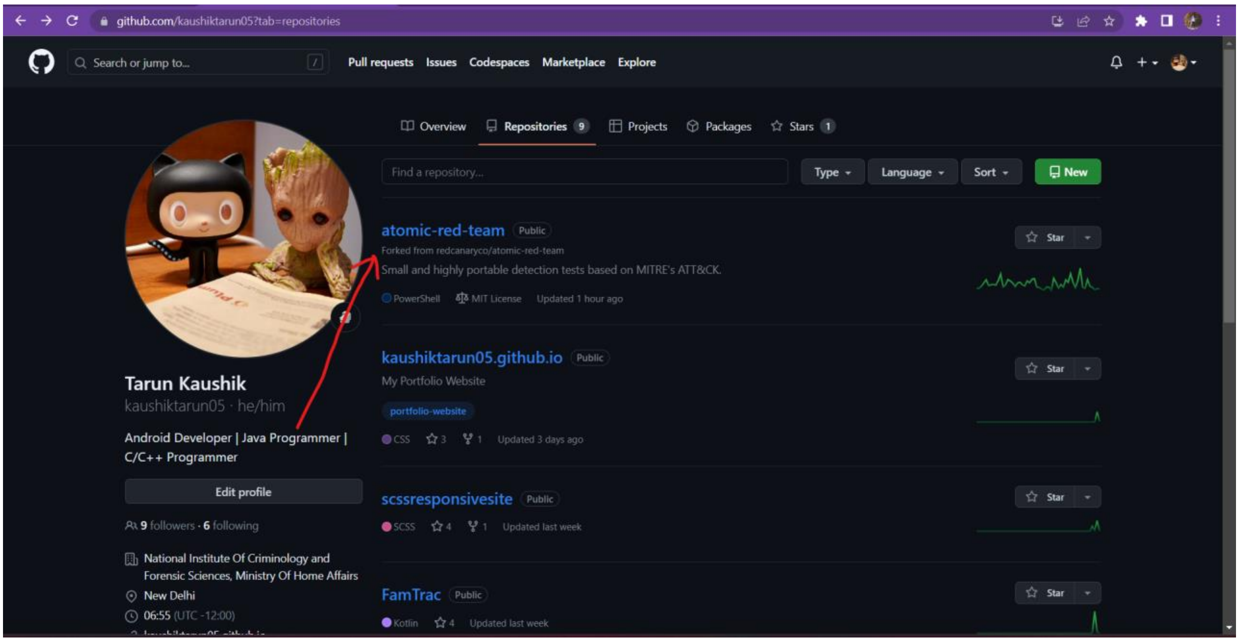
Clone and setup your repository in preparation for submitting a PR in GitHub



```
# Cloned fork of the Red Canary Atomic Red Team™ Repository
git clone https://github.com/mightyrock05/atomic-red-team.git

# Change directories into the cloned repository
cd atomic-red-team

# Set your origin (your fork) and your upstream (Red Canary's repo)
# You have to do this every time you re-clone your repo, which likely is not often
git remote set-url origin https://github.com/mightyrock05/atomic-red-team.git
git remote add upstream https://github.com/redcanaryco/atomic-red-team.git

# Update your forked master branch to match Red Canary's repo
# Do this right before creating a feature branch and working on it
git checkout master
git fetch --all
git rebase upstream/master
git push origin master

# Create a new branch from master to work on your new feature and switch to it
git checkout -b bhumiitech_test

# Add and commit your new/modified files to your local branch
git add /path/to/new/changed/file.yaml     # repeat for multiple files as needed
git commit -m "Changed has been commenced"

# Push the changes out to your repository residing in GitHub on the web
# The output from this command will tell you where to go on the web to submit the PR
git push origin bhumiitech_test
```

Note:

These git commands can be used on both our VM's i.e., on Kali Purple and Windows 11.



atomic-red-team Public
Forked from redcanaryco/atomic-red-team
Small and highly portable detection tests based on MITRE's ATT&CK.
PowerShell · MIT License · Updated 1 hour ago

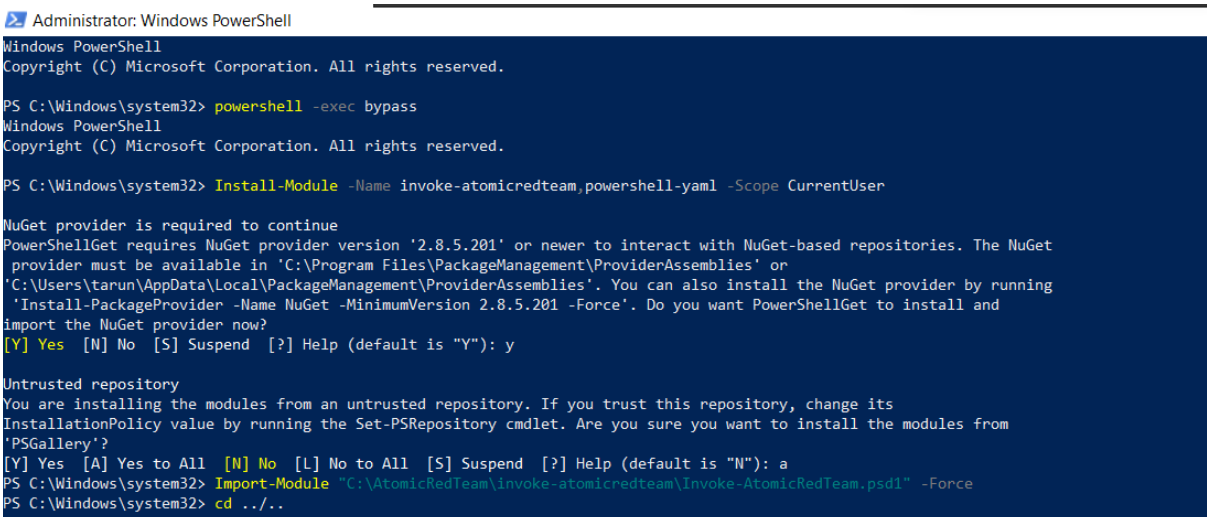
kaushiktarun05.github.io Public
My Portfolio Website
portfolio-website
CSS · 3 · 1 · Updated 3 days ago

scssresponsivesite Public
SCSS · 4 · 1 · Updated last week

FamTrac Public
Kotlin · 4 · Updated last week

Tarun Kaushik
kaushiktarun05 · he/him
Android Developer | Java Programmer | C/C++ Programmer
9 followers · 6 following
National Institute Of Criminology and Forensic Sciences, Ministry Of Home Affairs
New Delhi
06:55 (UTC -12:00)

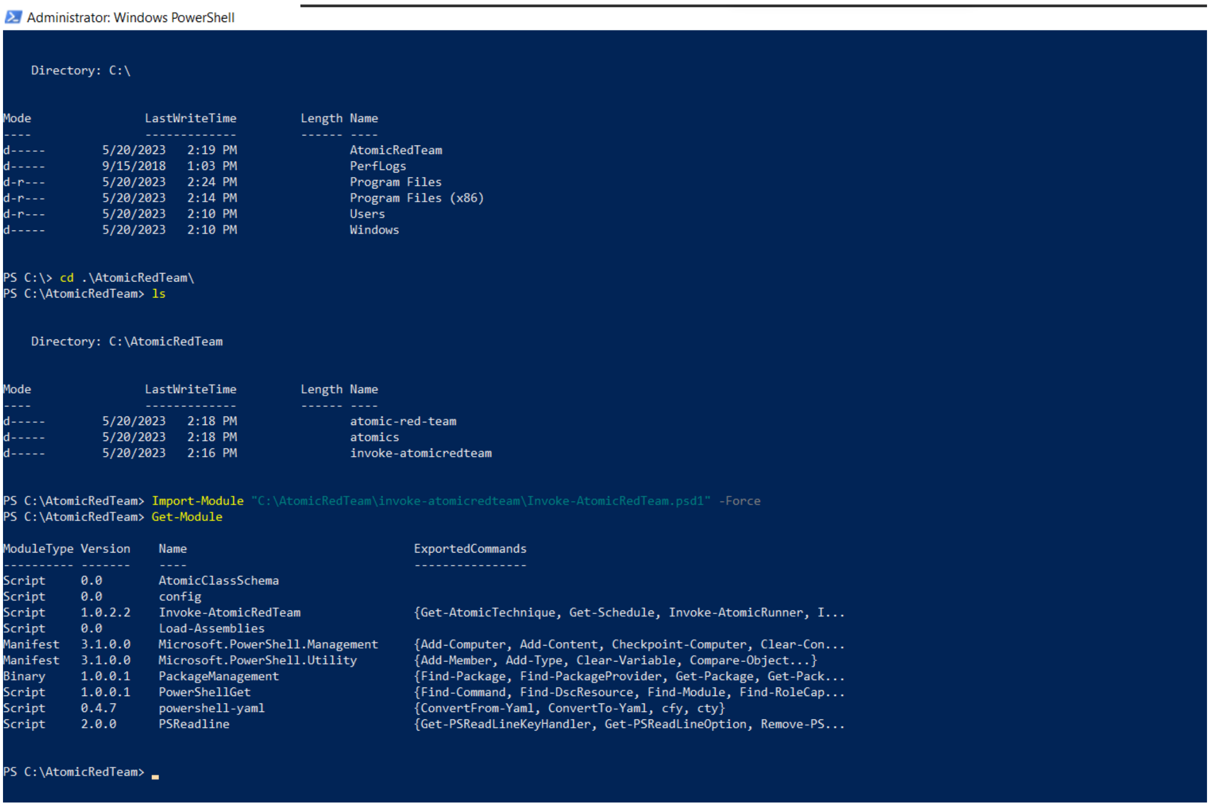
Setting up Atomic Red Team for attack



Administrator: Windows PowerShell

```
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Windows\system32> powershell -exec bypass
Windows PowerShell
Copyright (C) Microsoft Corporation. All rights reserved.

PS C:\Windows\system32> Install-Module -Name invoke-atomicredteam,powershell-yaml -Scope CurrentUser

NuGet provider is required to continue
PowerShellGet requires NuGet provider version '2.8.5.201' or newer to interact with NuGet-based repositories. The NuGet
 provider must be available in 'C:\Program Files\PackageManagement\ProviderAssemblies' or
'C:\Users\tarun\AppData\Local\PackageManagement\ProviderAssemblies'. You can also install the NuGet provider by running
 'Install-PackageProvider -Name NuGet -MinimumVersion 2.8.5.201 -Force'. Do you want PowerShellGet to install and
import the NuGet provider now?
[Y] Yes  [N] No  [S] Suspend  [?] Help (default is "Y"): y

Untrusted repository
You are installing the modules from an untrusted repository. If you trust this repository, change its
InstallationPolicy value by running the Set-PSRepository cmdlet. Are you sure you want to install the modules from
'PSGallery'?
[Y] Yes  [A] Yes to All  [N] No  [L] No to All  [S] Suspend  [?] Help (default is "N"): a
PS C:\Windows\system32> Import-Module "C:\AtomicRedTeam\invoke-atomicredteam\Invoke-AtomicRedTeam.psd1" -Force
PS C:\Windows\system32> cd ../..
```

Importing and checking for Invoke Atomic red Module



Administrator: Windows PowerShell

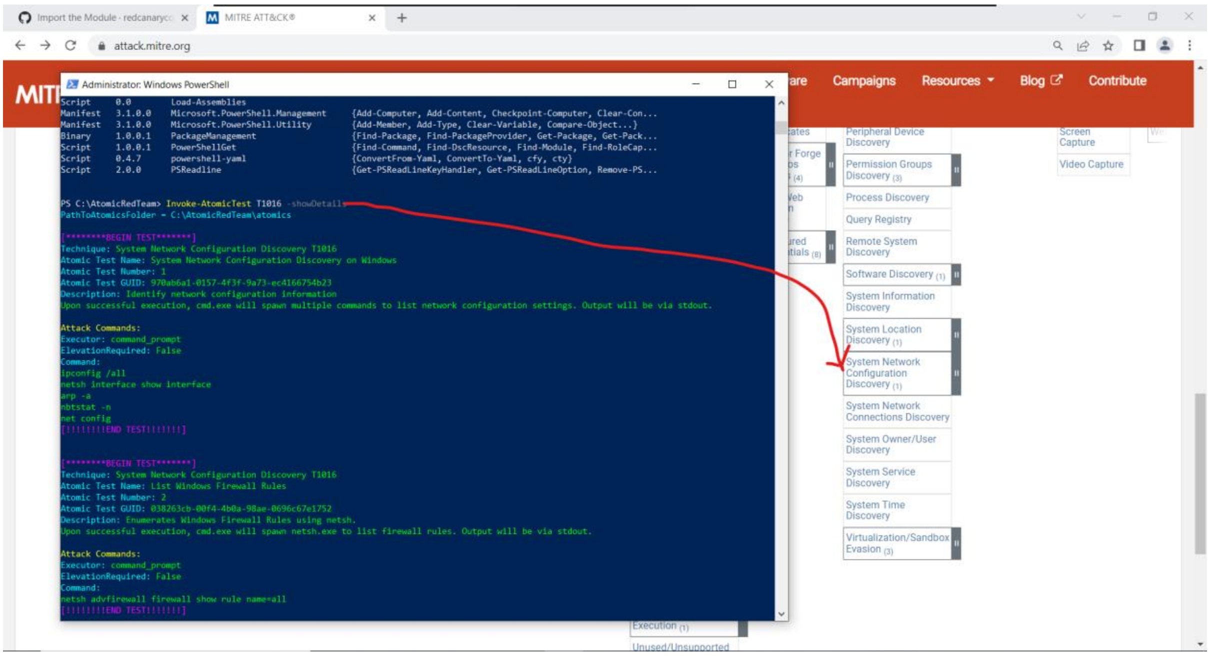
```

    Directory: C:\


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----         5/20/2023   2:19 PM                AtomicRedTeam
d-----         9/15/2018   1:03 PM                PerfLogs
d-r---         5/20/2023   2:24 PM                Program Files
d-r---         5/20/2023   2:14 PM                Program Files (x86)
d-r---         5/20/2023   2:10 PM                Users
d-----         5/20/2023   2:10 PM                Windows


PS C:\> cd .\AtomicRedTeam\
PS C:\AtomicRedTeam> ls


    Directory: C:\AtomicRedTeam


Mode                 LastWriteTime         Length Name
----                 -------------         ------ ----
d-----         5/20/2023   2:18 PM                atomic-red-team
d-----         5/20/2023   2:18 PM                atomics
d-----         5/20/2023   2:16 PM                invoke-atomicredteam


PS C:\AtomicRedTeam> Import-Module "C:\AtomicRedTeam\invoke-atomicredteam\Invoke-AtomicRedTeam.psd1" -Force
PS C:\AtomicRedTeam> Get-Module

ModuleType Version    Name                                ExportedCommands
---------- -------    ----                                ----------------
Script     0.0        AtomicClassSchema
Script     0.0        config
Script     1.0.2.2    Invoke-AtomicRedTeam                {Get-AtomicTechnique, Get-Schedule, Invoke-AtomicRunner, I...
Script     0.0        Load-Assemblies
Manifest   3.1.0.0    Microsoft.PowerShell.Management     {Add-Computer, Add-Content, Checkpoint-Computer, Clear-Con...
Manifest   3.1.0.0    Microsoft.PowerShell.Utility        {Add-Member, Add-Type, Clear-Variable, Compare-Object...}
Binary     1.0.0.1    PackageManagement                   {Find-Package, Find-PackageProvider, Get-Package, Get-Pack...
Script     1.0.0.1    PowerShellGet                       {Find-Command, Find-DscResource, Find-Module, Find-RoleCap...
Script     0.4.7      powershell-yaml                     {ConvertFrom-Yaml, ConvertTo-Yaml, cfy, cty}
Script     2.0.0      PSReadline                          {Get-PSReadLineKeyHandler, Get-PSReadLineOption, Remove-PS...


PS C:\AtomicRedTeam>
```

Test T1016

Test under discovery in the MITRE ATT&CK-->

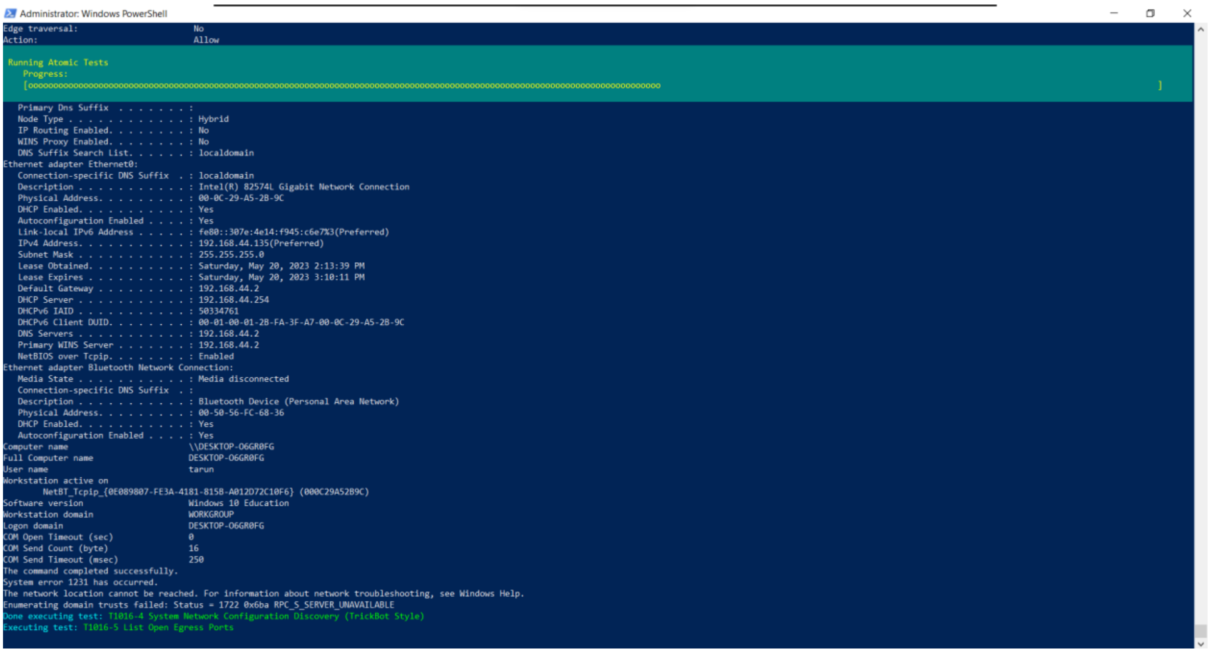
[System Network Configuration Discovery]

Test Details


Import the Module · redcanaryco
MITRE ATT&CK®
attack.mitre.org
Administrator: Windows PowerShell
Campaigns
Resources
Blog
Contribute
Peripheral Device Discovery
Permission Groups Discovery (3)
Process Discovery
Query Registry
Remote System Discovery
Software Discovery (1)
System Information Discovery
System Location Discovery (1)
System Network Configuration Discovery (1)
System Network Connections Discovery
System Owner/User Discovery
System Service Discovery
System Time Discovery
Virtualization/Sandbox Evasion (3)
Screen Capture
Video Capture
Execution (1)
Unused/Unsupported

```
Script     0.0        Load-Assemblies
Manifest   3.1.0.0    Microsoft.PowerShell.Management     {Add-Computer, Add-Content, Checkpoint-Computer, Clear-Con...
Manifest   3.1.0.0    Microsoft.PowerShell.Utility        {Add-Member, Add-Type, Clear-Variable, Compare-Object...}
Binary     1.0.0.1    PackageManagement                   {Find-Package, Find-PackageProvider, Get-Package, Get-Pack...
Script     1.0.0.1    PowerShellGet                       {Find-Command, Find-DscResource, Find-Module, Find-RoleCap...
Script     0.4.7      powershell-yaml                     {ConvertFrom-Yaml, ConvertTo-Yaml, cfy, cty}
Script     2.0.0      PSReadline                          {Get-PSReadLineKeyHandler, Get-PSReadLineOption, Remove-PS...


PS C:\AtomicRedTeam> Invoke-AtomicTest T1016 -showDetails
PathToAtomicsFolder = C:\AtomicRedTeam\atomics

[********BEGIN TEST*******]
Technique: System Network Configuration Discovery T1016
Atomic Test Name: System Network Configuration Discovery on Windows
Atomic Test Number: 1
Atomic Test GUID: 970ab6a1-0157-4f3f-9a73-ec4166754b23
Description: Identify network configuration information
Upon successful execution, cmd.exe will spawn multiple commands to list network configuration settings. Output will be via stdout.

Attack Commands:
Executor: command_prompt
ElevationRequired: False
Command:
ipconfig /all
netsh interface show interface
arp -a
nbtstat -n
net config
[!!!!!!!!END TEST!!!!!!!]


[********BEGIN TEST*******]
Technique: System Network Configuration Discovery T1016
Atomic Test Name: List Windows Firewall Rules
Atomic Test Number: 2
Atomic Test GUID: 038263cb-00f4-4b0a-98ae-0696c67e1752
Description: Enumerates Windows Firewall Rules using netsh.
Upon successful execution, cmd.exe will spawn netsh.exe to list firewall rules. Output will be via stdout.

Attack Commands:
Executor: command_prompt
ElevationRequired: False
Command:
netsh advfirewall firewall show rule name=all
[!!!!!!!!END TEST!!!!!!!]
```

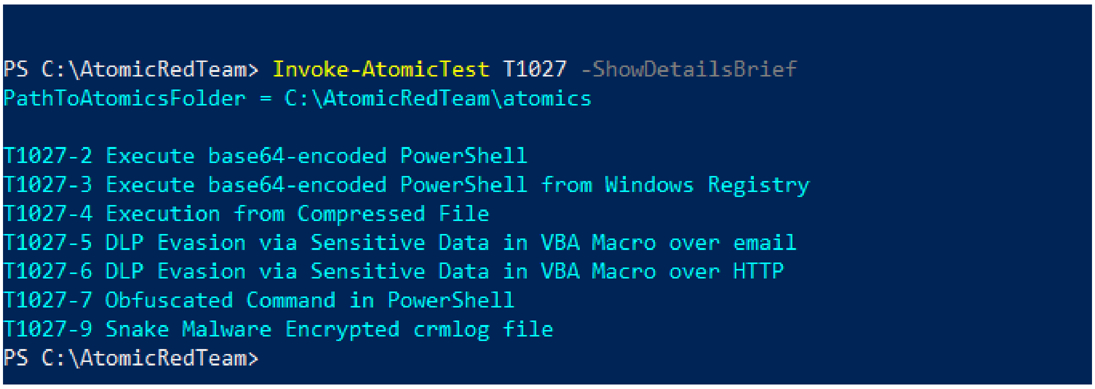
Running Test T1016



```
Edge traversal:                       No
Action:                               Allow

 Running Atomic Tests
    Progress:
    [oooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooooo                                                                              ]

   Primary Dns Suffix  . . . . . . . :
   Node Type . . . . . . . . . . . . : Hybrid
   IP Routing Enabled. . . . . . . . : No
   WINS Proxy Enabled. . . . . . . . : No
   DNS Suffix Search List. . . . . . : localdomain
Ethernet adapter Ethernet0:
   Connection-specific DNS Suffix  . : localdomain
   Description . . . . . . . . . . . : Intel(R) 82574L Gigabit Network Connection
   Physical Address. . . . . . . . . : 00-0C-29-A5-2B-9C
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
   Link-local IPv6 Address . . . . . : fe80::307e:4e14:f945:c6e7%3(Preferred)
   IPv4 Address. . . . . . . . . . . : 192.168.44.135(Preferred)
   Subnet Mask . . . . . . . . . . . : 255.255.255.0
   Lease Obtained. . . . . . . . . . : Saturday, May 20, 2023 2:13:39 PM
   Lease Expires . . . . . . . . . . : Saturday, May 20, 2023 3:10:11 PM
   Default Gateway . . . . . . . . . : 192.168.44.2
   DHCP Server . . . . . . . . . . . : 192.168.44.254
   DHCPv6 IAID . . . . . . . . . . . : 50334761
   DHCPv6 Client DUID. . . . . . . . : 00-01-00-01-2B-FA-3F-A7-00-0C-29-A5-2B-9C
   DNS Servers . . . . . . . . . . . : 192.168.44.2
   Primary WINS Server . . . . . . . : 192.168.44.2
   NetBIOS over Tcpip. . . . . . . . : Enabled
Ethernet adapter Bluetooth Network Connection:
   Media State . . . . . . . . . . . : Media disconnected
   Connection-specific DNS Suffix  . :
   Description . . . . . . . . . . . : Bluetooth Device (Personal Area Network)
   Physical Address. . . . . . . . . : 00-50-56-FC-68-36
   DHCP Enabled. . . . . . . . . . . : Yes
   Autoconfiguration Enabled . . . . : Yes
Computer name                        \\DESKTOP-O6GR0FG
Full Computer name                   DESKTOP-O6GR0FG
User name                            tarun
Workstation active on
        NetBT_Tcpip_{0E089807-FE3A-4181-815B-A012D72C10F6} (000C29A52B9C)
Software version                     Windows 10 Education
Workstation domain                   WORKGROUP
Logon domain                         DESKTOP-O6GR0FG
COM Open Timeout (sec)               0
COM Send Count (byte)                16
COM Send Timeout (msec)              250
The command completed successfully.
System error 1231 has occurred.
The network location cannot be reached. For information about network troubleshooting, see Windows Help.
Enumerating domain trusts failed: Status = 1722 0x6ba RPC_S_SERVER_UNAVAILABLE
Done executing test: T1016-4 System Network Configuration Discovery (TrickBot Style)
Executing test: T1016-5 List Open Egress Ports
```

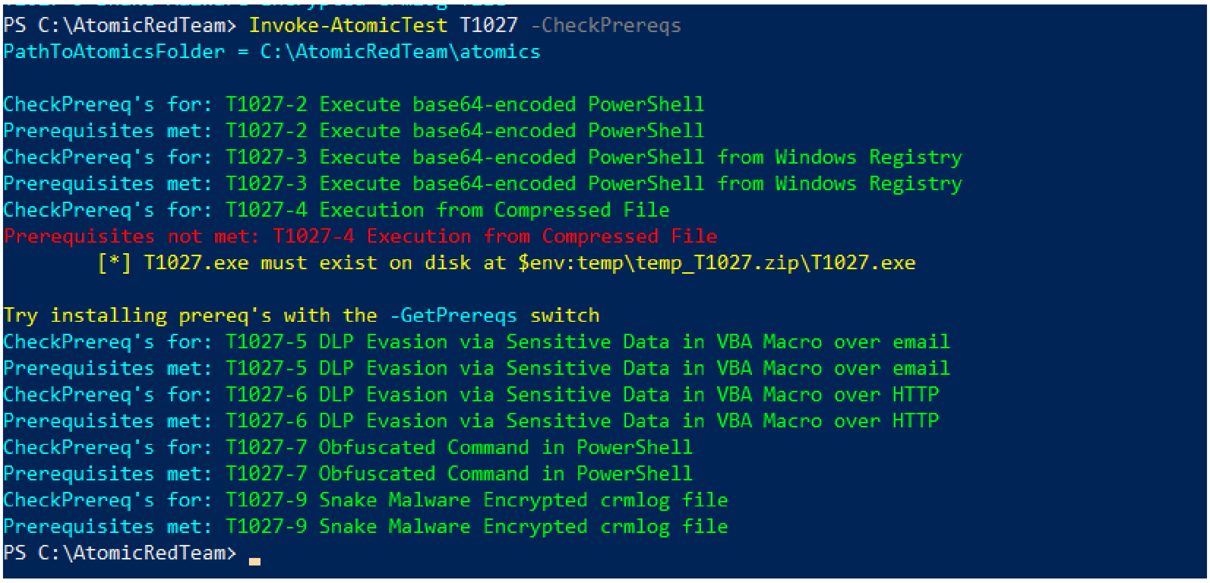
Test T1027

Test Details in Brief



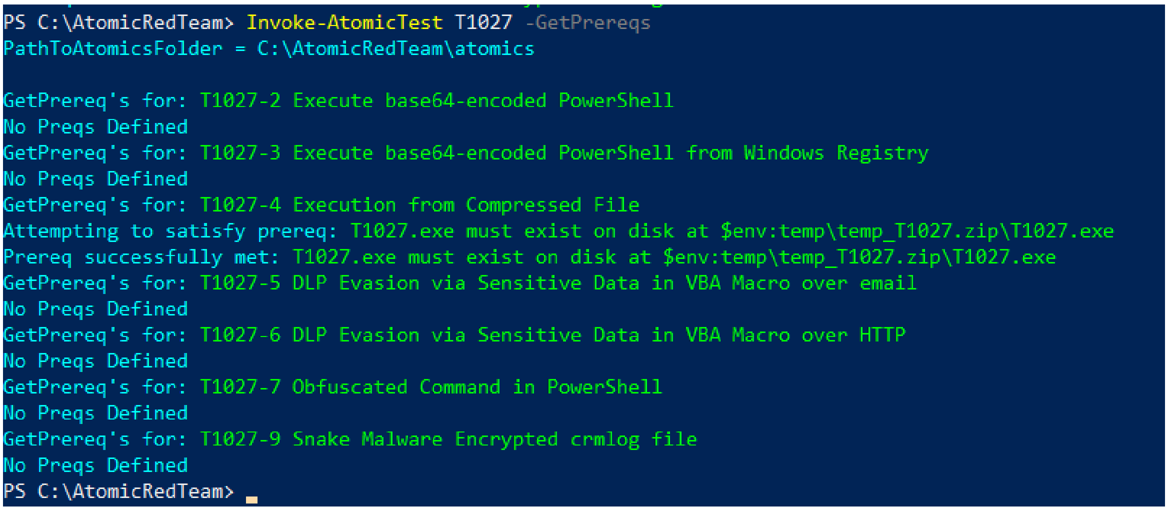
```
PS C:\AtomicRedTeam> Invoke-AtomicTest T1027 -ShowDetailsBrief
PathToAtomicsFolder = C:\AtomicRedTeam\atomics

T1027-2 Execute base64-encoded PowerShell
T1027-3 Execute base64-encoded PowerShell from Windows Registry
T1027-4 Execution from Compressed File
T1027-5 DLP Evasion via Sensitive Data in VBA Macro over email
T1027-6 DLP Evasion via Sensitive Data in VBA Macro over HTTP
T1027-7 Obfuscated Command in PowerShell
T1027-9 Snake Malware Encrypted crmlog file
PS C:\AtomicRedTeam>
```

Checking for prerequisites



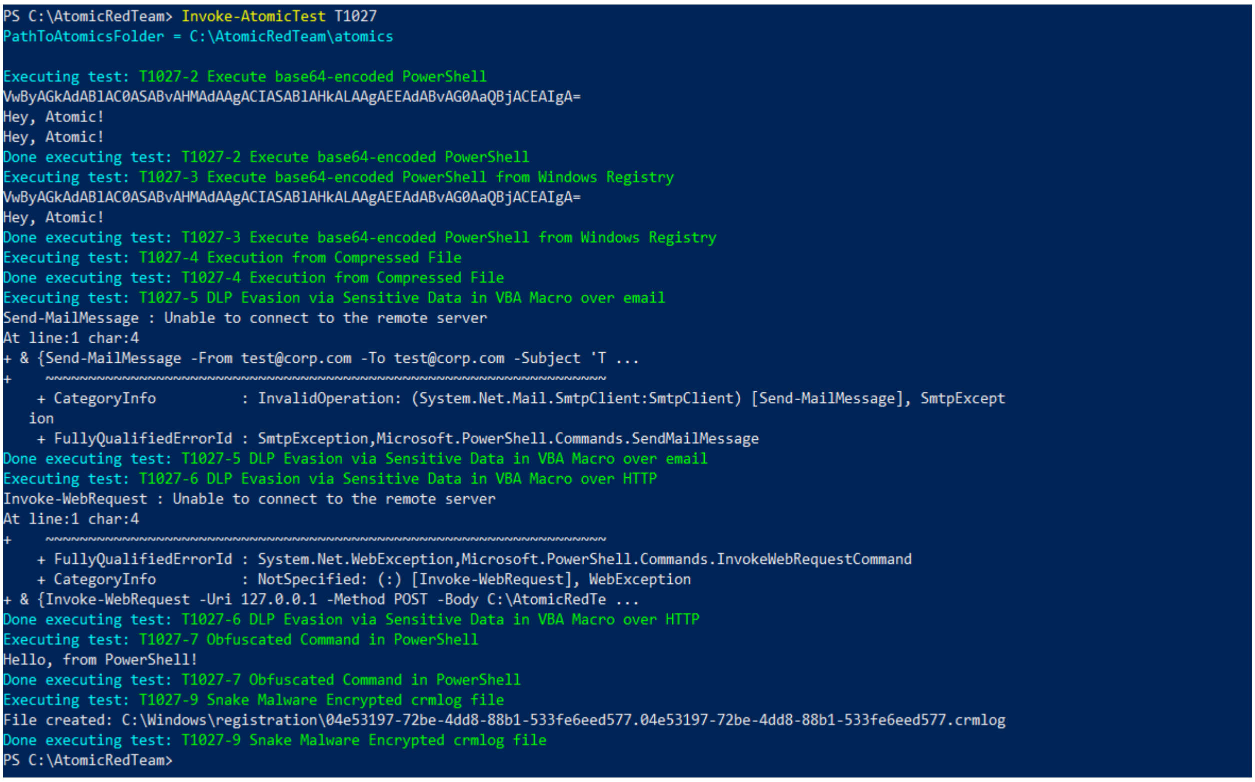
```
PS C:\AtomicRedTeam> Invoke-AtomicTest T1027 -CheckPrereqs
PathToAtomicsFolder = C:\AtomicRedTeam\atomics

CheckPrereq's for: T1027-2 Execute base64-encoded PowerShell
Prerequisites met: T1027-2 Execute base64-encoded PowerShell
CheckPrereq's for: T1027-3 Execute base64-encoded PowerShell from Windows Registry
Prerequisites met: T1027-3 Execute base64-encoded PowerShell from Windows Registry
CheckPrereq's for: T1027-4 Execution from Compressed File
Prerequisites not met: T1027-4 Execution from Compressed File
        [*] T1027.exe must exist on disk at $env:temp\temp_T1027.zip\T1027.exe

Try installing prereq's with the -GetPrereqs switch
CheckPrereq's for: T1027-5 DLP Evasion via Sensitive Data in VBA Macro over email
Prerequisites met: T1027-5 DLP Evasion via Sensitive Data in VBA Macro over email
CheckPrereq's for: T1027-6 DLP Evasion via Sensitive Data in VBA Macro over HTTP
Prerequisites met: T1027-6 DLP Evasion via Sensitive Data in VBA Macro over HTTP
CheckPrereq's for: T1027-7 Obfuscated Command in PowerShell
Prerequisites met: T1027-7 Obfuscated Command in PowerShell
CheckPrereq's for: T1027-9 Snake Malware Encrypted crmlog file
Prerequisites met: T1027-9 Snake Malware Encrypted crmlog file
PS C:\AtomicRedTeam> _
```

Fulfilling prerequisites for test



```
PS C:\AtomicRedTeam> Invoke-AtomicTest T1027 -GetPrereqs
PathToAtomicsFolder = C:\AtomicRedTeam\atomics

GetPrereq's for: T1027-2 Execute base64-encoded PowerShell
No Preqs Defined
GetPrereq's for: T1027-3 Execute base64-encoded PowerShell from Windows Registry
No Preqs Defined
GetPrereq's for: T1027-4 Execution from Compressed File
Attempting to satisfy prereq: T1027.exe must exist on disk at $env:temp\temp_T1027.zip\T1027.exe
Prereq successfully met: T1027.exe must exist on disk at $env:temp\temp_T1027.zip\T1027.exe
GetPrereq's for: T1027-5 DLP Evasion via Sensitive Data in VBA Macro over email
No Preqs Defined
GetPrereq's for: T1027-6 DLP Evasion via Sensitive Data in VBA Macro over HTTP
No Preqs Defined
GetPrereq's for: T1027-7 Obfuscated Command in PowerShell
No Preqs Defined
GetPrereq's for: T1027-9 Snake Malware Encrypted crmlog file
No Preqs Defined
PS C:\AtomicRedTeam> _
```

Running the Test



```
PS C:\AtomicRedTeam> Invoke-AtomicTest T1027
PathToAtomicsFolder = C:\AtomicRedTeam\atomics

Executing test: T1027-2 Execute base64-encoded PowerShell
VwByAGkAdABlAC0ASABvAHMAdAAgACIASABlAHkALAAgAEEAdABvAG0AaQBjACEAIgA=
Hey, Atomic!
Hey, Atomic!
Done executing test: T1027-2 Execute base64-encoded PowerShell
Executing test: T1027-3 Execute base64-encoded PowerShell from Windows Registry
VwByAGkAdABlAC0ASABvAHMAdAAgACIASABlAHkALAAgAEEAdABvAG0AaQBjACEAIgA=
Hey, Atomic!
Done executing test: T1027-3 Execute base64-encoded PowerShell from Windows Registry
Executing test: T1027-4 Execution from Compressed File
Done executing test: T1027-4 Execution from Compressed File
Executing test: T1027-5 DLP Evasion via Sensitive Data in VBA Macro over email
Send-MailMessage : Unable to connect to the remote server
At line:1 char:4
+ & {Send-MailMessage -From test@corp.com -To test@corp.com -Subject 'T ...
+    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
    + CategoryInfo          : InvalidOperation: (System.Net.Mail.SmtpClient:SmtpClient) [Send-MailMessage], SmtpExcept
   ion
    + FullyQualifiedErrorId : SmtpException,Microsoft.PowerShell.Commands.SendMailMessage
Done executing test: T1027-5 DLP Evasion via Sensitive Data in VBA Macro over email
Executing test: T1027-6 DLP Evasion via Sensitive Data in VBA Macro over HTTP
Invoke-WebRequest : Unable to connect to the remote server
At line:1 char:4
+    ~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~~
    + FullyQualifiedErrorId : System.Net.WebException,Microsoft.PowerShell.Commands.InvokeWebRequestCommand
    + CategoryInfo          : NotSpecified: (:) [Invoke-WebRequest], WebException
+ & {Invoke-WebRequest -Uri 127.0.0.1 -Method POST -Body C:\AtomicRedTe ...
Done executing test: T1027-6 DLP Evasion via Sensitive Data in VBA Macro over HTTP
Executing test: T1027-7 Obfuscated Command in PowerShell
Hello, from PowerShell!
Done executing test: T1027-7 Obfuscated Command in PowerShell
Executing test: T1027-9 Snake Malware Encrypted crmlog file
File created: C:\Windows\registration\04e53197-72be-4dd8-88b1-533fe6eed577.04e53197-72be-4dd8-88b1-533fe6eed577.crmlog
Done executing test: T1027-9 Snake Malware Encrypted crmlog file
PS C:\AtomicRedTeam>
```

Benefits and Challenges

Benefits:

Comprehensive Security Assessment:

Atomic Red Team provides a comprehensive framework for testing and evaluating security controls. It covers a wide range of attack techniques and scenarios, allowing organizations to identify vulnerabilities and weaknesses in their systems, applications, and infrastructure.

Realistic Simulations:

Atomic Red Team allows organizations to simulate real-world attack scenarios, mimicking the techniques used by adversaries. This provides a more accurate assessment of the organization's ability to detect and respond to such threats, enhancing overall readiness and incident response capabilities.

Enhanced Security Posture:

The combination of Kali Linux Purple and Windows 11 allows for a more comprehensive evaluation of security controls, thereby strengthening the organization's overall security posture. By identifying vulnerabilities and weaknesses, organizations can take proactive measures to address them, mitigating potential risks.

Proactive Defence:

By conducting regular Atomic Red Team tests, organizations can proactively identify vulnerabilities and weaknesses in their security controls. This enables them to address these issues before they can be exploited by malicious actors, reducing the risk of successful cyberattacks.

Challenges:

Resource Intensive:

Implementing Atomic Red Team requires significant resources, including dedicated systems or virtual machines, storage space, and computational power. Organizations need to allocate sufficient resources to effectively execute and manage the tests.

Complexity of Execution:

Atomic Red Team tests can be complex and require technical expertise to plan, execute, and interpret the results. Organizations need skilled professionals who understand the testing methodology, attack techniques, and security controls to ensure accurate and meaningful results.

Time and Effort:

Conducting Atomic Red Team tests can be time-consuming. It involves careful planning, execution, and analysis of results. Organizations need to allocate sufficient time and effort to properly conduct the tests and follow up on identified vulnerabilities.

False Positives and Negatives:

Atomic Red Team tests may generate false positives or false negatives, where legitimate security alerts are missed or benign activities are flagged as malicious. Organizations need to carefully evaluate the results to avoid unnecessary disruptions or overlooking genuine security threats.

Results and Findings

(To be updated at end of internship)

Conclusion

(To be updated at end of internship)

Appendix

(To be updated at end of internship)