

BloodHound Cheat Sheet

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[BloodHound](#) is a powerful security tool that uses graph theory to reveal the relationships between users, groups, and computers in a domain. In this comprehensive guide, we'll take a deep dive into BloodHound and its companion tool [SharpHound](#), providing you with the knowledge and skills needed to navigate and utilize these tools to their fullest potential.

Introduction to BloodHound

BloodHound is an open-source tool that allows you to map out the relationships between users, groups, and computers in a domain. It uses graph theory to analyze the data it collects and visually represents the relationships between different entities. BloodHound can be used to identify potential attack paths, misconfigured permissions, and other security weaknesses in your Active Directory environment.

To start with BloodHound, you must install it on your system and connect it to your Active Directory domain. Once connected, you can use BloodHound to perform a variety of tasks, including:

- Identifying high-value targets
- Mapping out attack paths
- Analyzing permissions and access controls
- Finding misconfigured settings
- Identifying potential security weaknesses

SharpHound Enumeration Options

SharpHound is a companion tool to BloodHound to gather data from Active Directory. It provides various enumeration options that allow you to collect information about users, groups, and computers in a domain. These options include:

- CollectionMethod: This option determines which data is collected. The default option collects group membership, domain trust, local admin, and session information. Other options include group membership only, local admin only, RDP users, and more.
- Domainname: This option specifies the domain to enumerate.
- Stealth: This option lowers the amount of noise the tool generates and runs it single-threaded.
- ExcludeDomainControllers: This option excludes domain controllers from the enumeration process.
- ComputerFile: This option specifies a list of computer names or IPs to enumerate.
- LDAPFilter: This option filters on specific AD attributes.

SharpHound Connection & Performance Options

To use SharpHound effectively, you need to specify connection and performance options. These options include:

- DomainController: This option specifies which domain controller to use.
- Stealth: This option lowers the amount of noise the tool generates and runs it single-threaded.
- Throttle: This option specifies the delay between requests in milliseconds. The default value is 0.
- Jitter: This option adds jitter to the throttle value in percent.

SharpHound Output Options

SharpHound provides several options for outputting the data it collects. These options include:

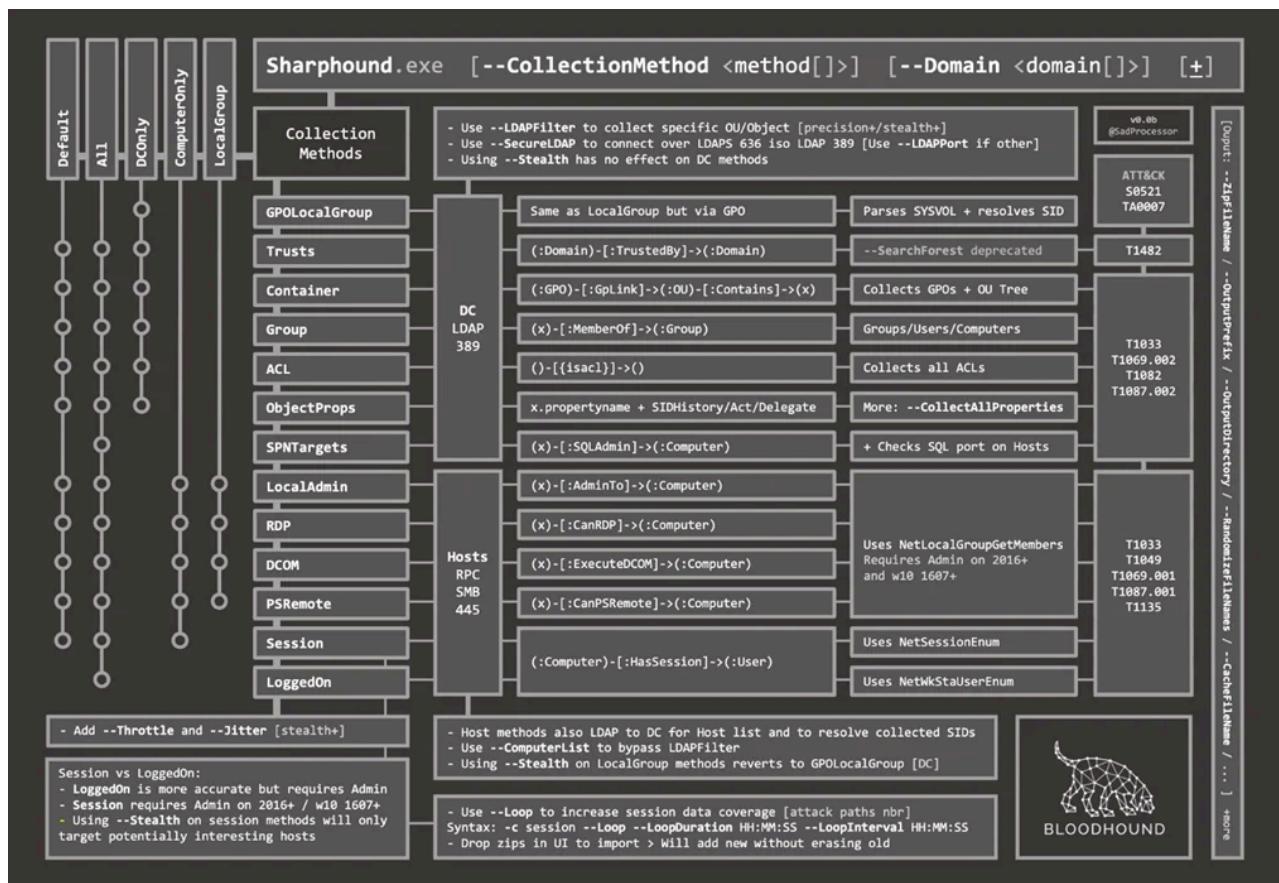
- OutputDirectory: This option specifies the directory to store the JSON output files. The default value is “.”.

- OutputPrefix: This option specifies the prefix for the JSON output files.
- PrettyJson: This option adds indentation to the JSON for readability but increases the file size.
- NoZip: This option disables the compression of JSON files.
- ZipFileName: This option specifies the filename for the zip file.
- EncryptZip: This option adds a password to the zip file, which is randomly generated.

SharpHound Loop Options

SharpHound also provides options for looping through the enumeration process. These options include:

- Loop: This option enables looping.
- LoopDuration: This option specifies the duration of the loop.
- LoopInterval: This option specifies the wait time between loops.



Handy DB Queries

Once you've collected data using SharpHound, you can utilize BloodHound to visualize the relationships between different entities. BloodHound uses a query language called Cypher to query the graph database. Here are some handy DB queries that you can use to analyze the data:

Count the LAPS status of all computers

```
MATCH (c:Computer) RETURN c.haslaps, COUNT(*)
```

Get a list of all OS versions with a count

```
MATCH (c:Computer) RETURN DISTINCT c.operatingsystem,  
COUNT(c.operatingsystem)
```

Get a list of all OS versions containing ‘Server’

```
MATCH (c:Computer) WHERE c.operatingsystem CONTAINS ‘Server’ RETURN  
DISTINCT c.operatingsystem
```

Get all Windows 2008 computers and sort by last logon timestamp descending and human-readable

```
MATCH (c:Computer) WHERE c.operatingsystem CONTAINS ‘2008’ RETURN c.name,  
c.operatingsystem, datetime({ epochSeconds: toInteger(c.lastlogontimestamp) }) AS rdate  
ORDER BY rdate DESC
```

Get all Domain Admins

```
MATCH (g:Group) WHERE g.name =~ “(?i).*DOMAIN ADMINS.*” WITH g MATCH (g)<-[r:MemberOf*1..]-(a) RETURN a.name
```

Get active sessions of Domain Admins

```
MATCH (u:User)-[:MemberOf*1..]->(g:Group) WHERE g.objectid ENDS WITH ‘-512’  
MATCH p = (c:Computer)-[:HasSession]->(u) RETURN c.name, u.name
```

Find all Kerberoastable users

```
MATCH (u:User) WHERE u.hasspn=true RETURN u.name
```

Find all AS-REP-roastable users

```
MATCH (u:User {dontreqpreauth: true}) RETURN u.name
```

Get the local admins to all computers

```
MATCH p=(u:User)-[r:AdminTo]->(c:Computer) RETURN u.name, c.name ORDER BY  
u.name
```

Find all Kerberoastable users with the path to DA

```
MATCH (u:User {hasspn:true}) MATCH (g:Group) WHERE g.name CONTAINS ‘DOMAIN  
ADMINS’ MATCH p = shortestPath( (u)-[*1..]->(g) ) RETURN p
```

Find all computers domain users can RDP to

```
MATCH p=(g:Group)-[:CanRDP]->(c:Computer) WHERE g.objectid ENDS WITH ‘-513’  
RETURN p
```

BloodHound Installation and Usage

To use BloodHound, you first need to install it on your system. BloodHound is available for download from the official BloodHound Github repository. Depending on your preference, you can choose to download the C#, ps1, or Python version of the tool.

The screenshot shows the GitHub releases page for the BloodHound project. The URL in the address bar is github.com/BloodHoundAD/BloodHound/releases. The page displays the 'Contributors' section with 12 contributors shown as icons. Below that is the 'Assets' section, which lists various zip files for different operating systems and architectures. The files listed are:

Asset	Size	Last Updated
BloodHound-darwin-arm64.zip	107 MB	May 24
BloodHound-darwin-x64.zip	105 MB	May 24
BloodHound-linux-arm64.zip	106 MB	May 24
BloodHound-linux-armv7l.zip	93.3 MB	May 24
BloodHound-linux-x64.zip	102 MB	May 24
BloodHound-win32-arm64.zip	108 MB	May 24
BloodHound-win32-ia32.zip	99.8 MB	May 24
BloodHound-win32-x64.zip	104 MB	May 24
Source code (zip)		May 23
Source code (tar.gz)		May 23

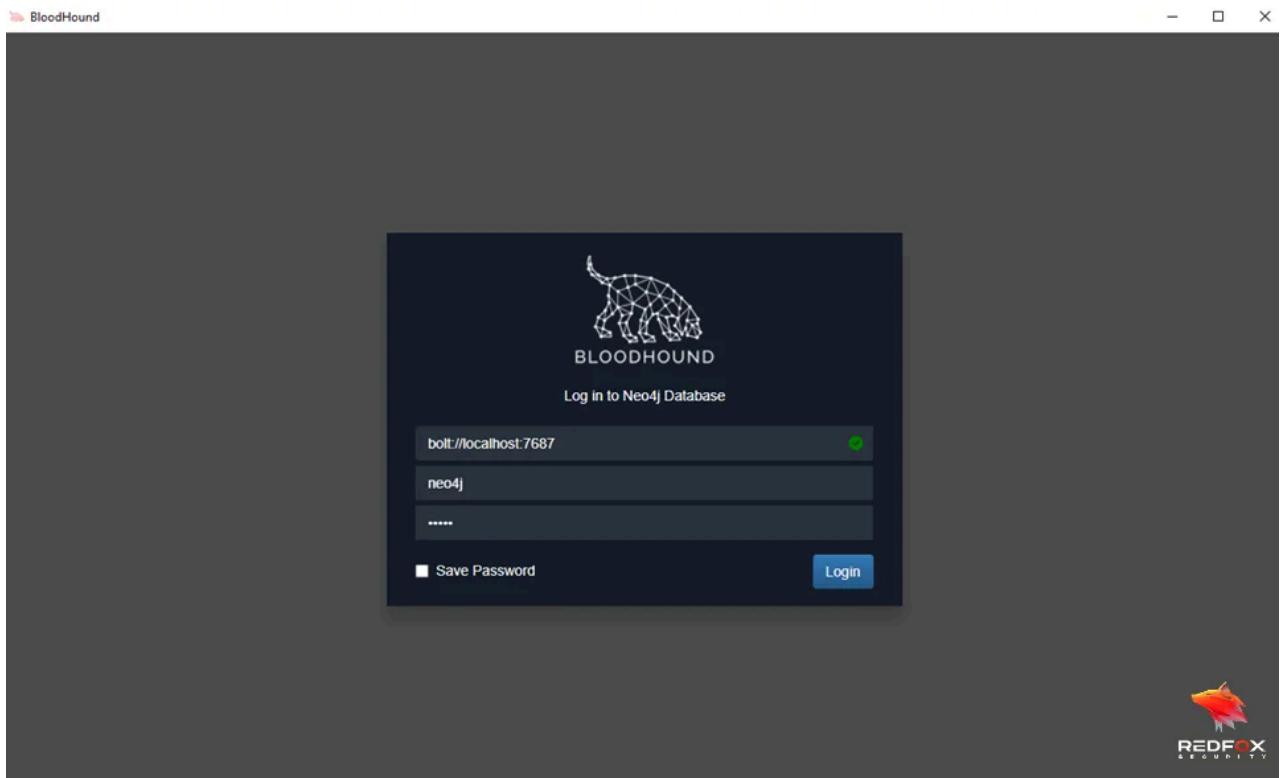
Below the assets, there are reaction counts: 6 likes, 2 stars, 1 fork, and 2 comments. The page footer indicates it was last updated on Apr 18 and shows the version v4.3.0. A REDFOX logo is visible in the bottom right corner.

<https://github.com/BloodHoundAD/BloodHound/releases>

Once you've downloaded BloodHound, you need to start Neo4j, the graph database that BloodHound uses to store data. You can do this by navigating to the BloodHound folder and running the command "Neo4j.bat console". This will start Neo4j in console mode.

The screenshot shows a Windows file explorer window and a terminal window. The file explorer is open to the 'bin' directory of the Neo4j installation. The 'neo4j.bat' file is highlighted with a red box. The terminal window below shows the command being run: `C:\Users\...\Documents\neo4j-community-5.9.0-windows\neo4j-community-5.9.0\bin>neo4j.bat console`.

Next, you'll need to run the BloodHound application and connect it to the database. Drag and drop the SharpHound zip file onto the BloodHound interface to do this. This will begin the data import process. Once the data has been imported, you can use the BloodHound interface to visualize the relationships between different entities in your domain.



The BloodHound interface has various features that allow you to analyze the data it collects. The “Analysis” section contains pre-built queries that you can use to explore the data. The “Pathfinding” feature allows you to find potential attack paths between entities. You can click on a node to view details about that entity, and the “Unrolled” items will show parent items.

BloodHound

Analysis

Pre-Built Analytics Queries

- Domain Information
 - Find all Domain Admins
 - Map Domain Trusts
 - Find Computers with Unsupported Operating Systems
- Dangerous Privileges
 - Find Principals with DCSync Rights
 - Users with Foreign Domain Group Membership
 - Groups with Foreign Domain Group Membership
 - Find Computers where Domain Users are Local Admin
 - Find Computers where Domain Users can read LAPS passwords
 - Find All Paths from Domain Users to High Value Targets
 - Find Workstations where Domain Users can RDP
 - Find Servers where Domain Users can RDP
 - Find Dangerous Privileges for Domain Users Groups
 - Find Domain Admin Logons to non-Domain Controllers
- Kerberos Interaction

Raw Query

BloodHound

Analysis

Find Workstations where Domain Users can RDP

Find Servers where Domain Users can RDP

Find Dangerous Privileges for Domain Users Groups

Find Domain Admin Logons to non-Domain Controllers

Kerberos Interaction

Find Kerberoastable Members of High Value Groups

List all Kerberoastable Accounts

Find Kerberoastable Users with most privileges

Find AS-REP Roastable Users (DontReqPreAuth)

Shortest Paths

Shortest Paths to Unconstrained Delegation Systems

Shortest Paths from Kerberoastable Users

Shortest Paths to Domain Admins from Kerberoastable Users

Shortest Path from Owned Principals

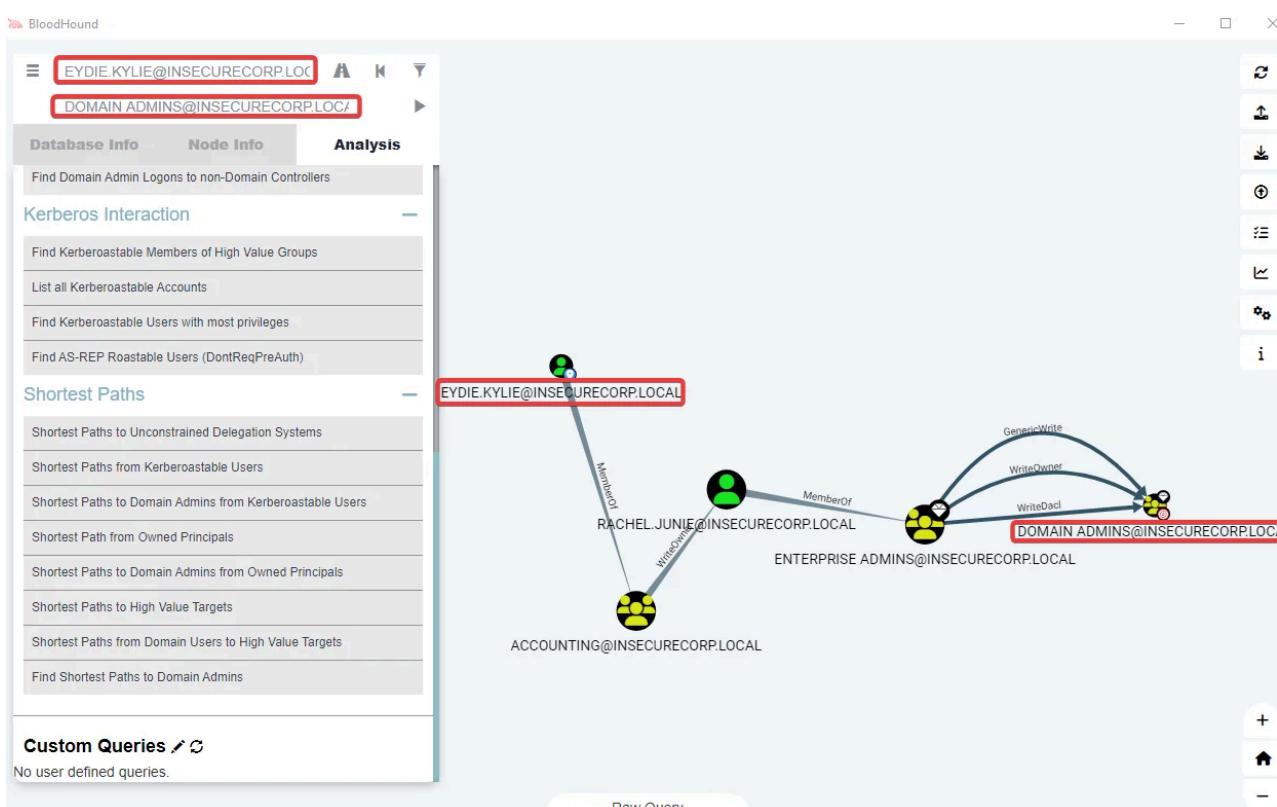
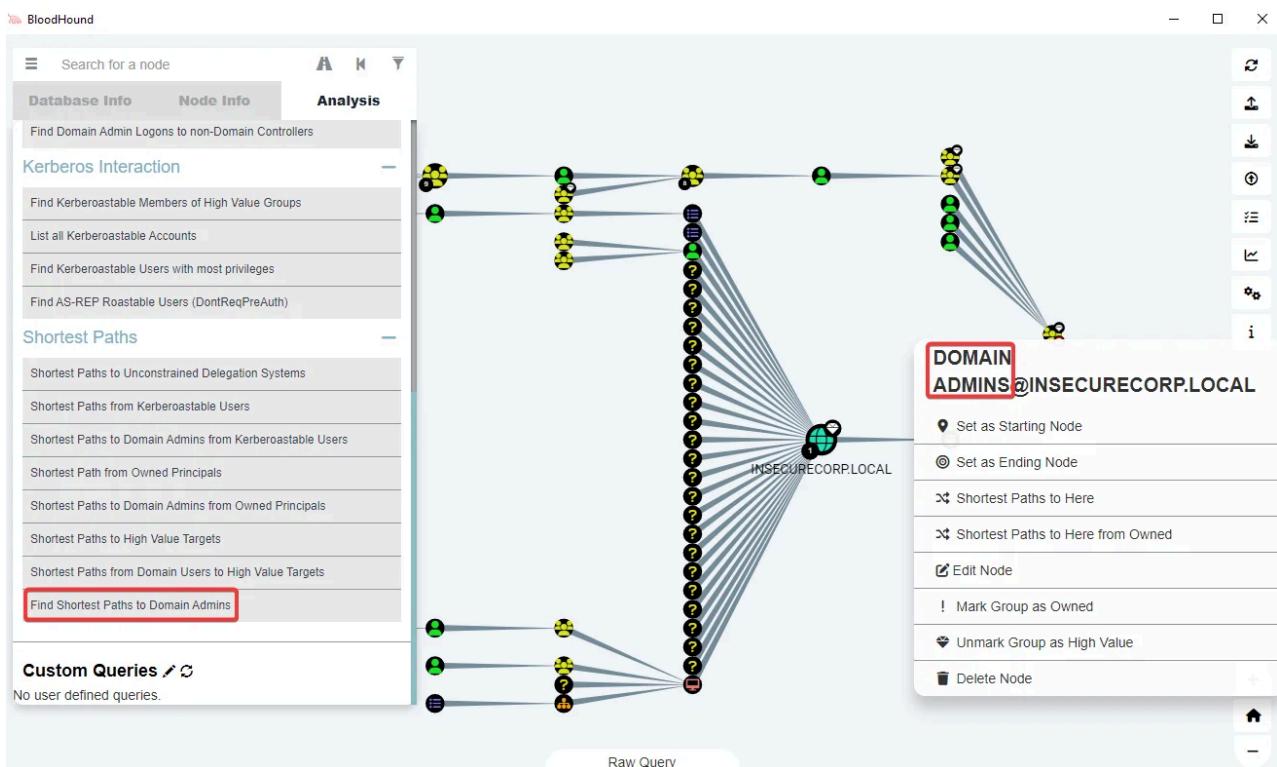
Shortest Paths to Domain Admins from Owned Principals

Shortest Paths to High Value Targets

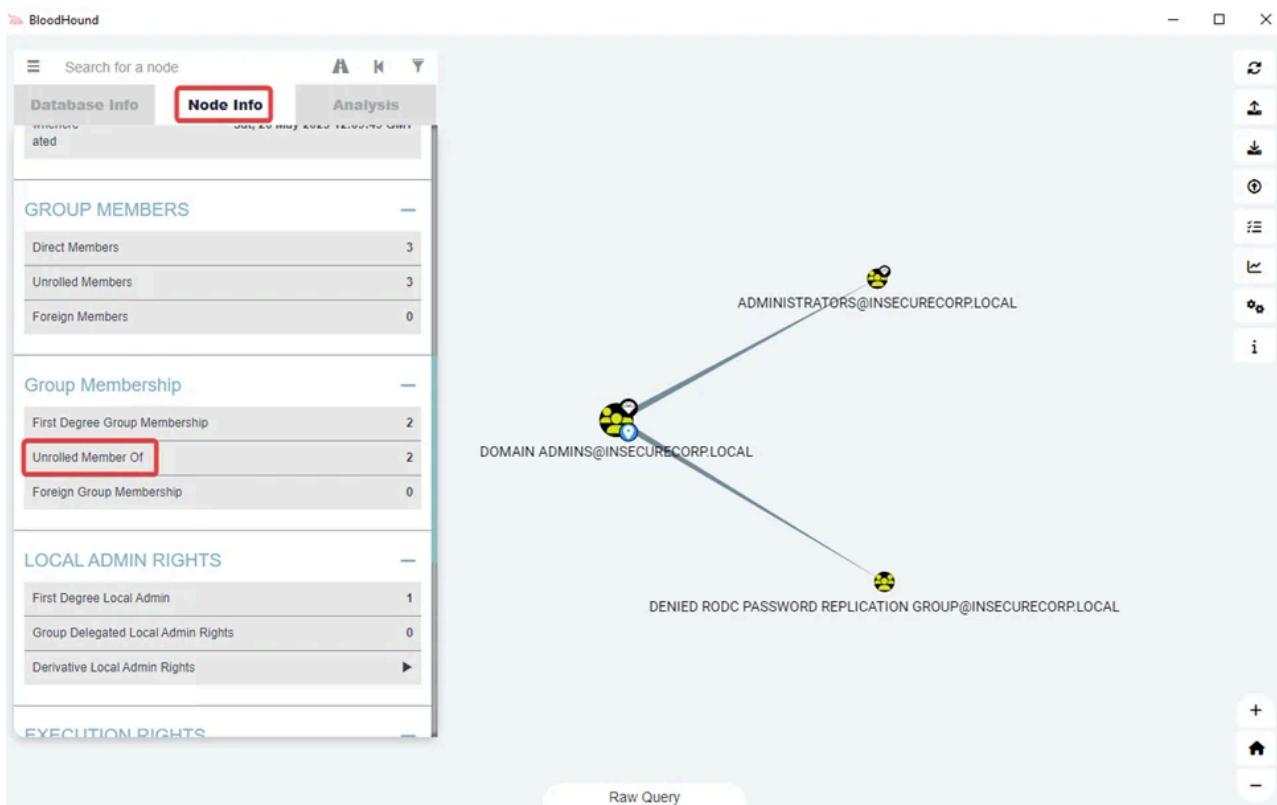
Shortest Paths from Domain Users to High Value Targets

Raw Query

Also, it is really useful in finding all the shortest paths to Domain Admins.



You can click on a node to view details about that entity, and the "Unrolled" items will show parent items.



TL;DR

BloodHound and SharpHound are powerful tools to help you identify potential security weaknesses in your Active Directory environment. By utilizing the query language Cypher and the visualization capabilities of BloodHound, you can gain valuable insights into the relationships between different entities in your domain. With the knowledge and skills gained from this comprehensive guide, you'll be well on your way to becoming a skilled, innovative, and reliable security expert who values efficiency and creativity, able to cater to various security needs with practical solutions.

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