Six Degrees of Domain Admin

About Us

I am Andy Robbins

Job: Pentester at Veris Group's ATD
Speaker: BSidesLV/Seattle, ISC2 World Congress, ISSA International
Trainer: Black Hat USA 2016
Other: Ask me about ACH

Twitter: @_wald0

About Us

I am Rohan Vazarkar

Job: Pentester at Veris Group's ATD
Tool creator/dev: EyeWitness, Python Empyre, etc.
Presenter: BSidesDC/LV/DE, Black Hat Arsenal
Trainer: Black Hat USA 2016

Twitter: @CptJesus

About Us

I am Will Schroeder

Job: Researcher at Veris Group's ATD
Tool creator/dev: Veil-Framework, PowerView, PowerUp, Empire/Empyre
Speaker: Ask me
Trainer: Black Hat USA 2014-2016
Other: Microsoft PowerShell/CDM MVP

Twitter: @harmj0y

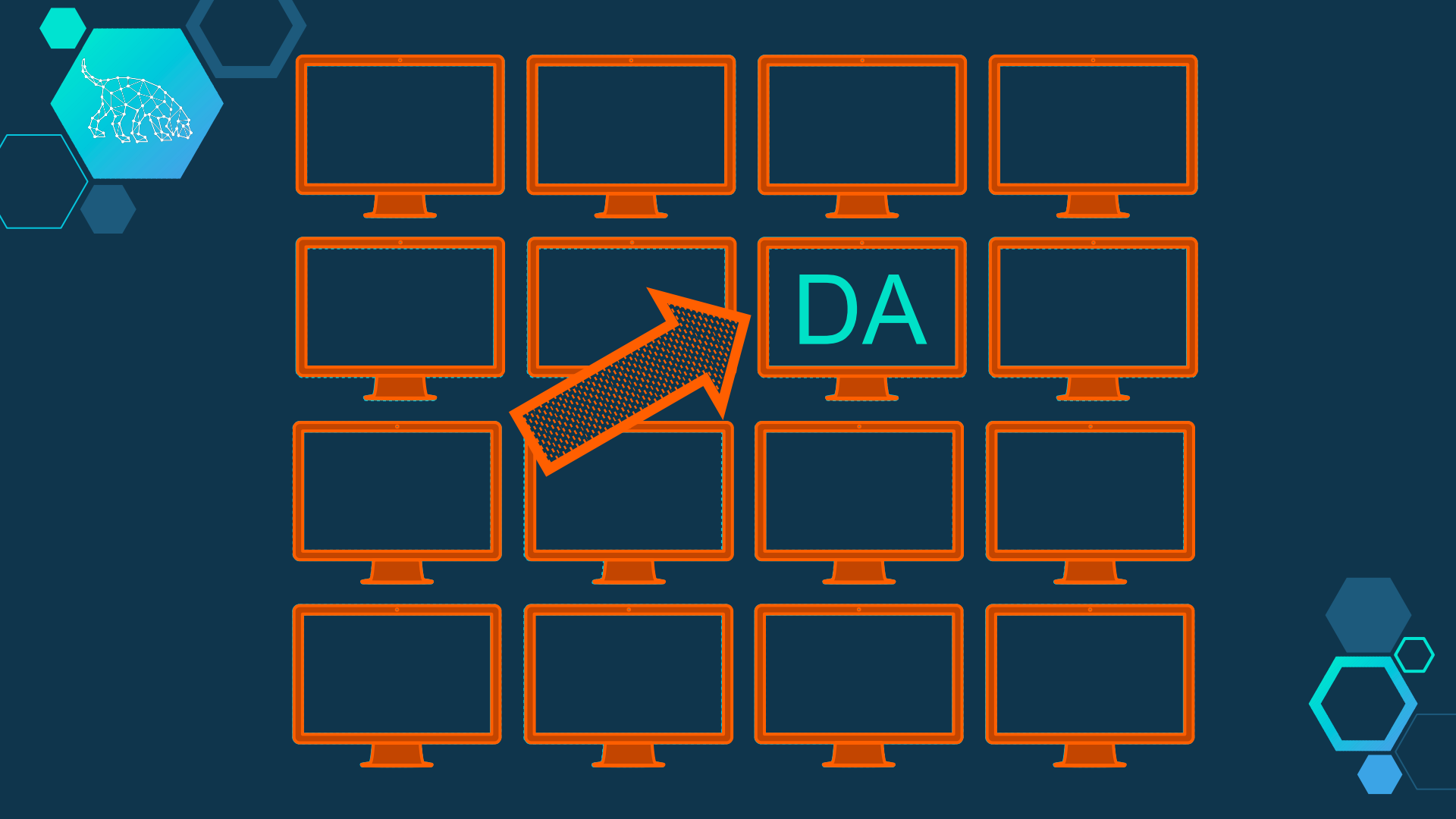
The Current State of Active Directory Domain Privilege Escalation

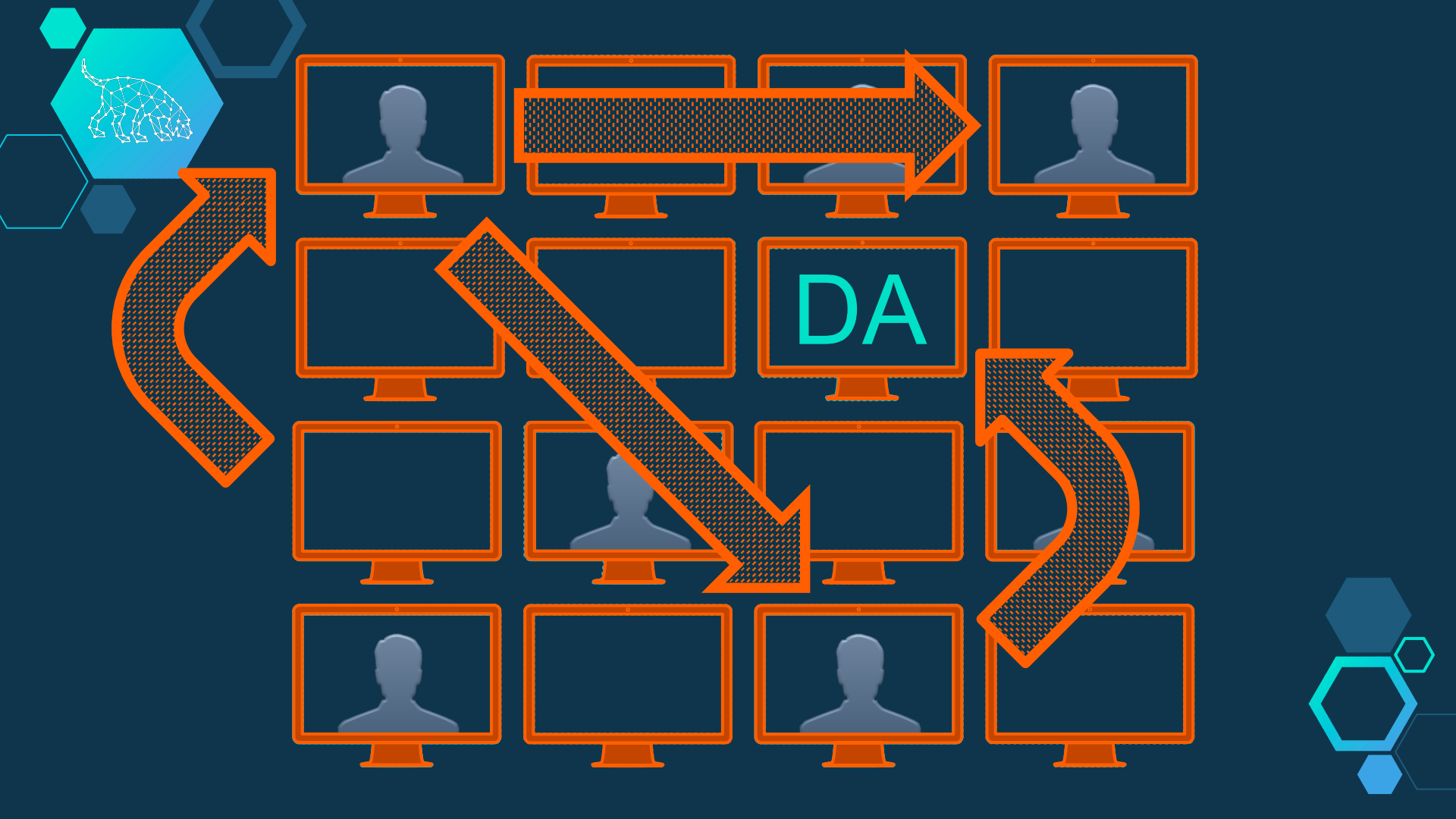
“Defenders think in lists. Attackers think in graphs. As long as this is true, attackers win.”

John Lambert
GM, Microsoft Threat Intelligence Center

AD Domain Priv Esc

- Active Directory is ubiquitous
- Ubiquity = Attention = Research time and $$$
- Sometimes we get easy buttons!


DA

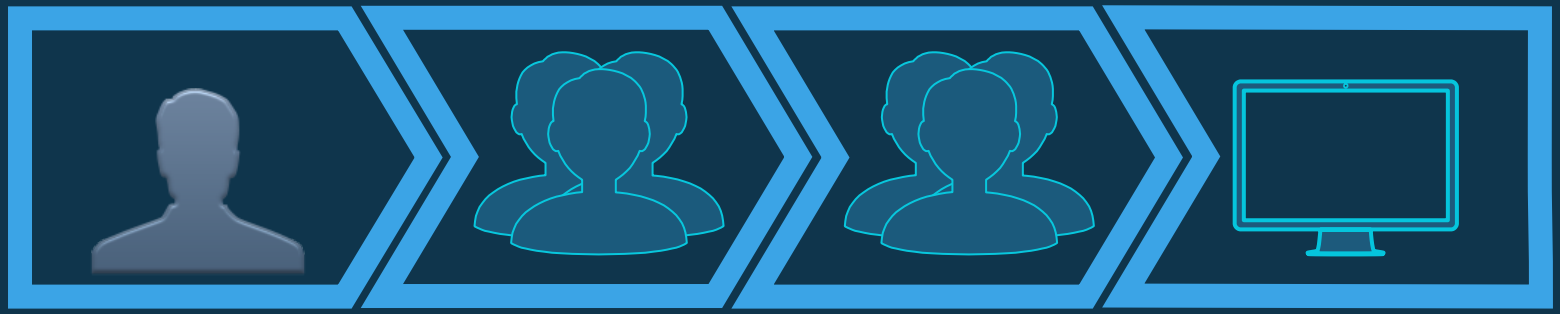

DA

Derivative Local Admin

“The chaining or linking of administrator rights through compromising other privileged accounts”

Justin Warner @sixdub


Bob
PC1
Mary
PC2


Bob
Help Desk
Server Admins
PC2

Challenges

- Extremely time consuming and tedious
- Not comprehensive
- Limited situational awareness
- Did you even need DA?

Graph Theory

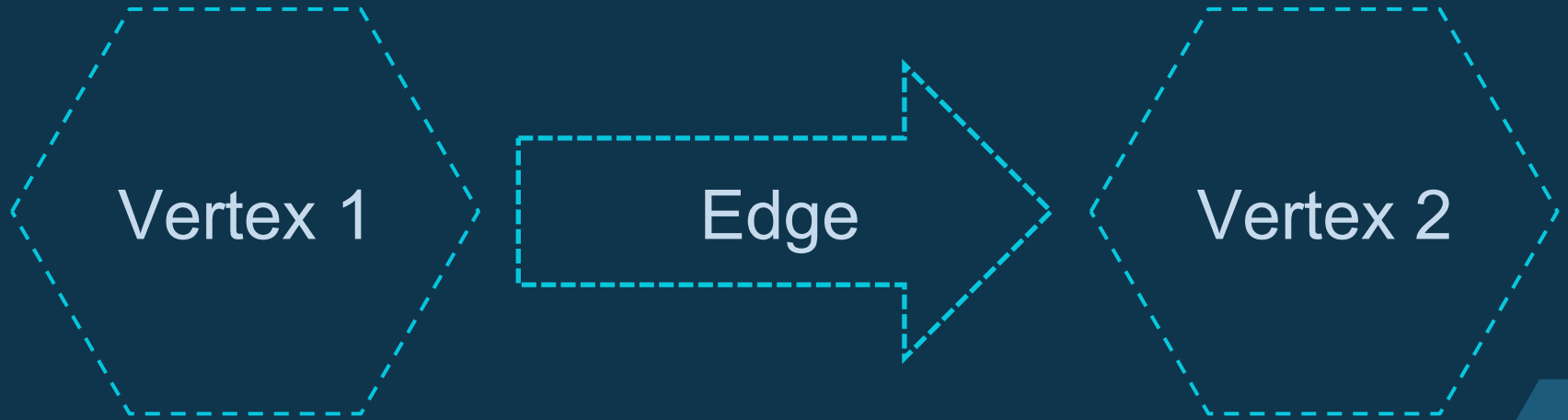
And attack graph design

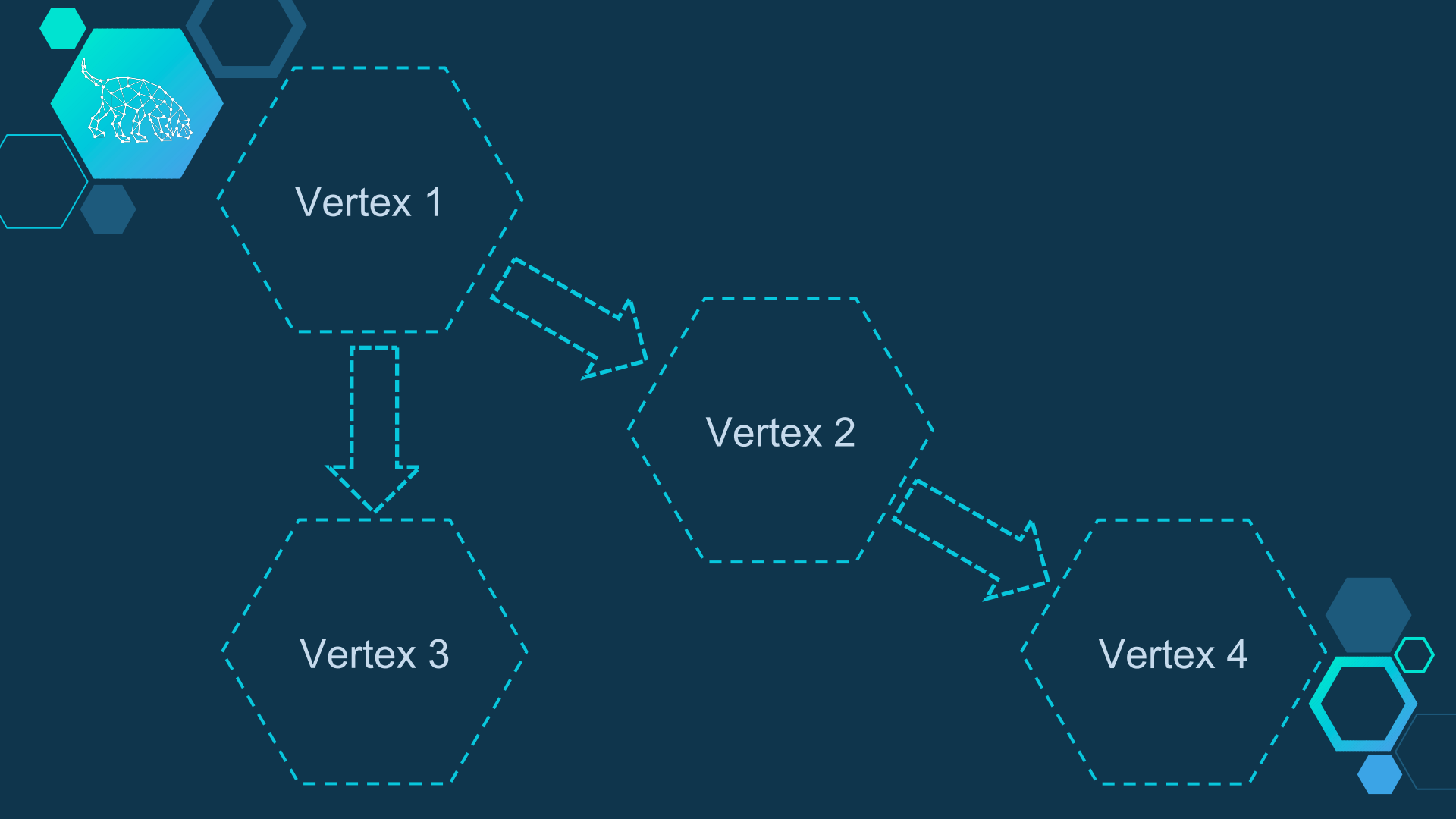
Basic Elements of a Graph

Vertices represent individual elements of a system

Edges generically represent relationships between vertices

Paths are sets of vertices and edges that connect non-adjacent vertices


Vertex 1
Edge
Vertex 2

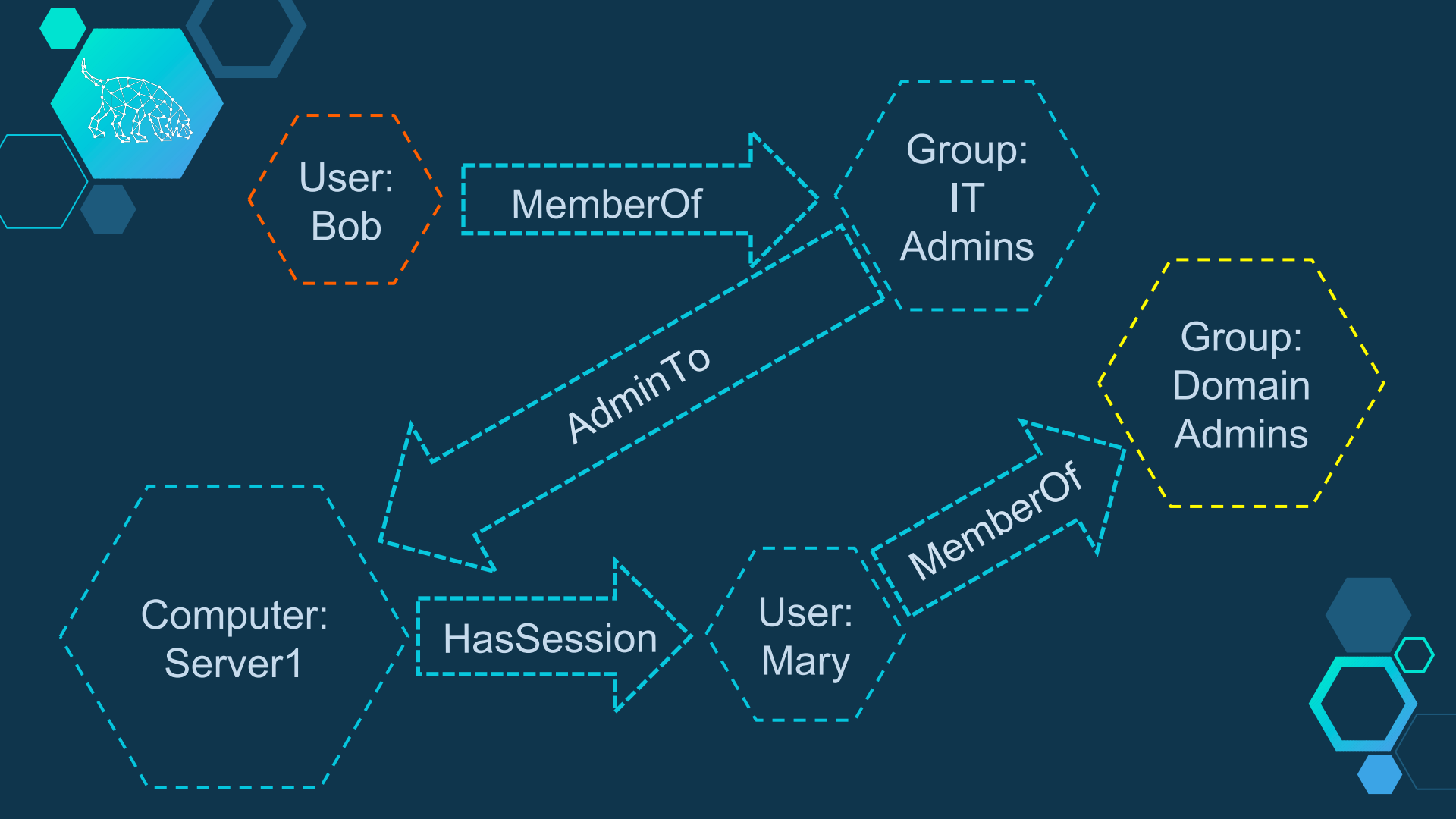

Vertex 1
Vertex 2
Vertex 3
Vertex 4

BloodHound Attack Graph Design

Vertices represent users, groups, computers, and domains

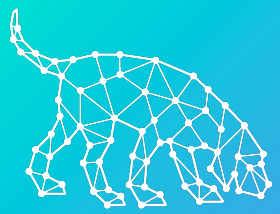
Edges identify group memberships, admin rights, user sessions, and domain trusts

Paths always lead toward escalating rights. Always.


User:
Bob
MemberOf
Group:
IT
Admins
AdminTo
Group:
Domain
Admins
Computer:
Server1
HasSession
User:
Mary
MemberOf

Put Simply…

- Who is logged on where?
- Who has admin rights where?
- What users and groups belong to what groups?



Stealthy Data Collection with PowerView

“The best tool these days for understanding Windows networks is PowerView…”

Phineas Phisher
http://pastebin.com/raw/0SNSvyjJ

PowerView

- A pure PowerShell v2.0+ domain/network situational awareness tool
- Collects the data that BloodHound is built on ***and doesn't need elevated privileges for most collection methods!***

Who's Logged in Where?

aka "user hunting"

- **Invoke-UserHunter**:
  - **Get-NetSession** – sessions w/ a remote machine
  - **Get-NetLoggedOn/Get-LoggedOnLocal** – who's logged in on what machine

- **-Stealth**:
  - Enumerate commonly trafficked servers and query remote sessions for each

Who Can Admin What?

- We can enumerate members of a **local** group on a **remote** machine, *without admin privileges!*
  - The WinNT service provider or **NetLocalGroupMembers()**
- PowerView:
  - **Get-NetLocalGroup –ComputerName IP [-API]**

Who Can Admin What?

GPO Edition

- GPOs can set local administrators
- GPOs are applied to OUs/Sites
  - correlation == local admin information through communication with only a DC!

- PowerView:
  - **Find-GPOLocation**

Who’s in What Groups?

- Enumerate all groups and pull the members of each
- PowerView:
  - **Get-NetGroup | Get-NetGroupMember**
- That’s it!

Bringing it All Together

The BloodHound Ingestor

Get-BloodHoundData automates gathering PowerView data for a domain

Export-BloodHoundData exports collected data to a neo4j batch REST API for ingestion

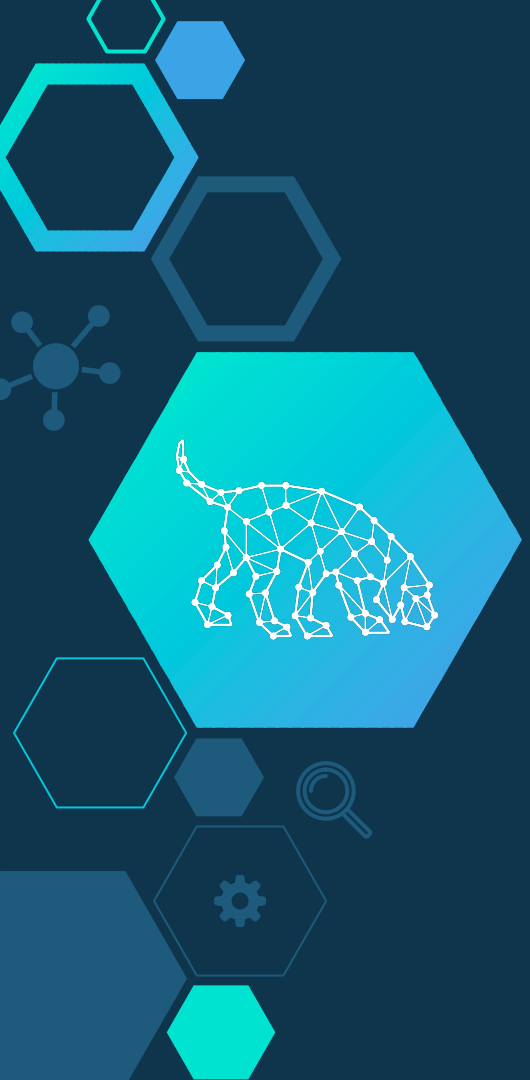
Export-BloodHoundCSV exports collected data to a series of CSVs for offline ingestion

BloodHound

Live demo!

BloodHound

- Built with Linkurious.js
- Compiled with Electron
- Uses a neo4j graph database
- Fed by the custom PowerShell ingestor



bit.ly/GetBloodHound

Thanks!

@_wald0
@CptJesus
@harmj0y