COMMAND & CONQUER: RED ALERT

C2 TRADECRAFT AND DESIGN CONCEPTS

IN THIS TALK

- About me
- Quick intro to C2's
- Pentest, red team and adversary differences
- Some famous C2's in the wild
- Design Considerations
- Examples
- Demo (pre-recorded)

ABOUT ME

- Lee Kagan
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- RedBlack Security –Toronto
- Adversary systems, MS stuff, threat intel, heavy metal \m/
- Blog - invokethreat.actor

QUICK INTRO TO C2 – A definition

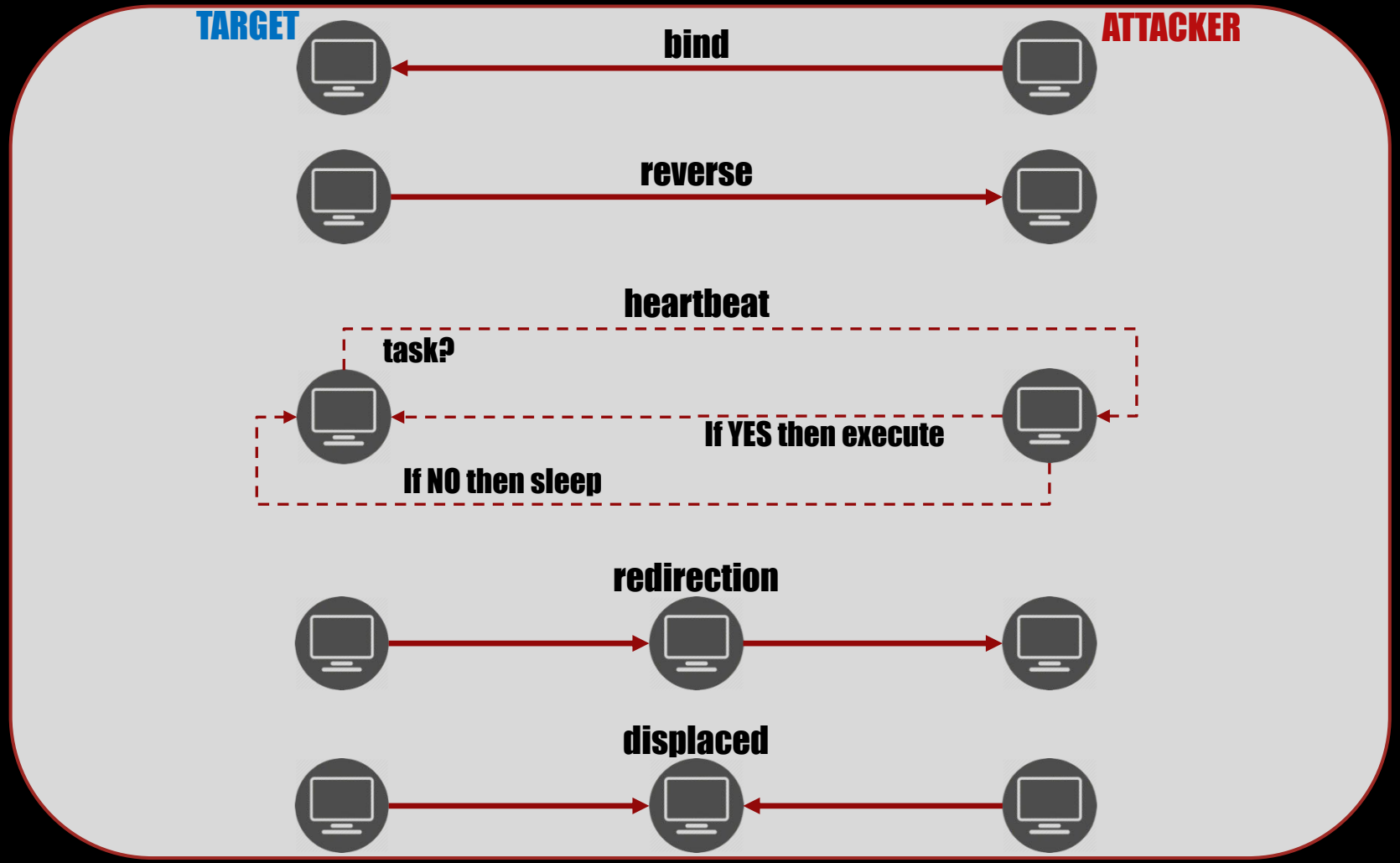
"The exercise of authority and direction by a properly designated commander over assigned and attached forces in the accomplishment of the mission. Also called C2"

- https://fas.org/irp/doddir/dod/jp1.pdf

QUICK INTRO TO C2 - Purpose

- Operator(s) behind the infrastructure
- Means to command the target
- Means to receive information from the target
- Means to distance the operator(s) from the target
- Means to evade, hide and thwart investigation
- Means to simulate and test
- Means to be in full control

QUICK INTRO TO C2 – Example Connection Types



C2 Differences – Penetration Testing

- Very low complexity
- Can be 1-to-1
  - Kali laptop attacking target directly
- Maybe a cloud VM or two
  - Kali on Digital Ocean, Burp collaborator, payload host or phishing instance
- Often not trying to ‘appear’ as anything specific
- Can be a single penetration tester

C2 Differences – Threat Actors

- Doesn’t need to be fancy
  - More concerned with ‘get the job done’
- Black market access
  - Why build when you can rent
- Compromise hosts all over the place
  - Why rent when you can pwn
  - Weaponize the newest exploits and vulnerabilities
- Size and scale
  - Great force multiplier

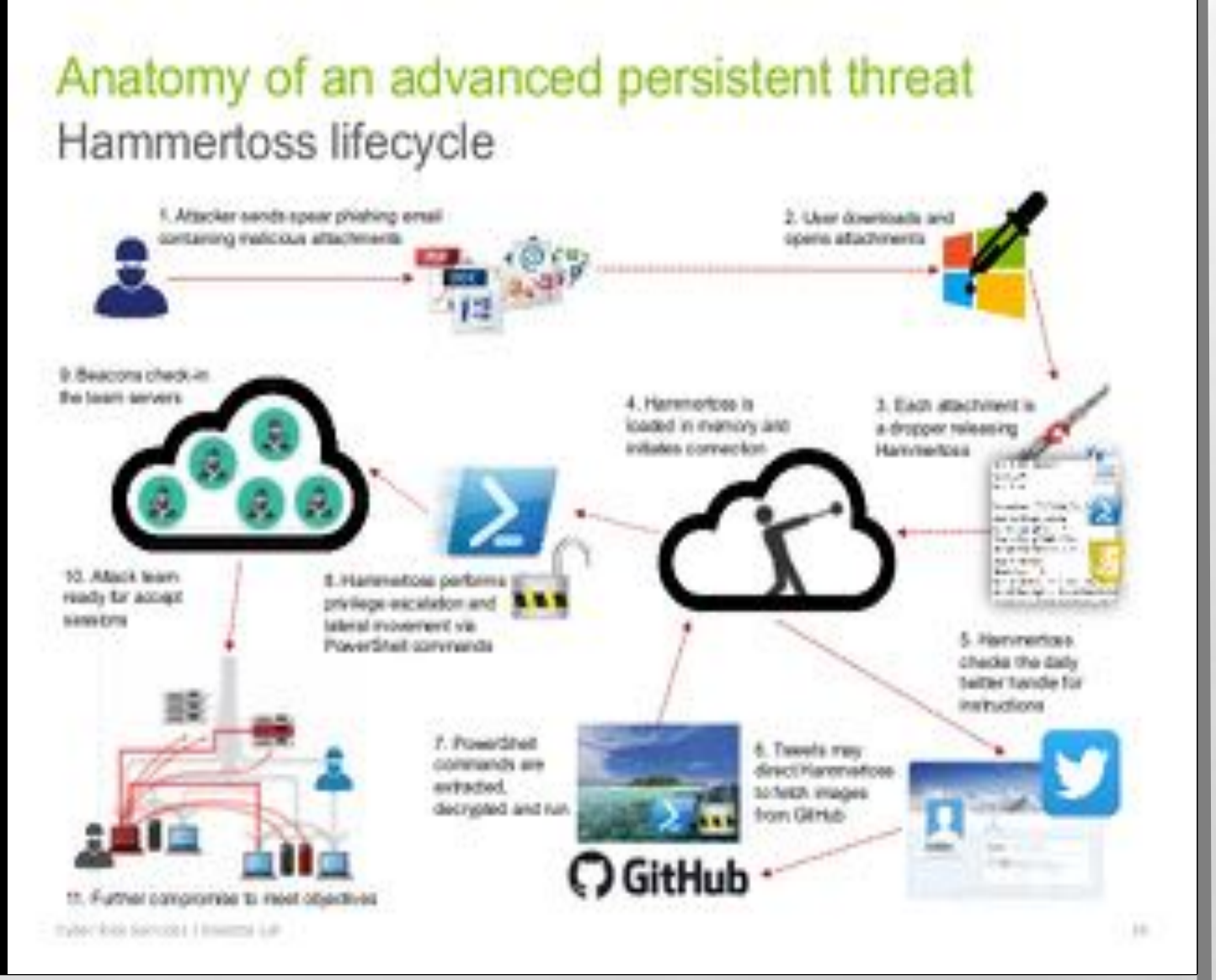
C2 Differences – Red Team

- Can be the most complex of all
- Many operators using the infrastructure
  - Often broken down into teams or ‘cells’
- Defensive controls and security
  - There’s a blue team trying to knock you down
- Logging of everything is critical
- Simulating ‘something’

FAMOUS C2 – The Dukes / APT29

- Starts with good ol' phishing
- Attachment drops HAMMERTOSS
- HAMMERTOSS loads in memory
- Leverages 3rd party services
  - Twitter
  - Github
- Daily tweet containing next stage instructions
- Get a picture from Github (stego)
- Decrypt the payload in the picture
- Leverage PowerShell to privesc and move laterally

- Operators have their access

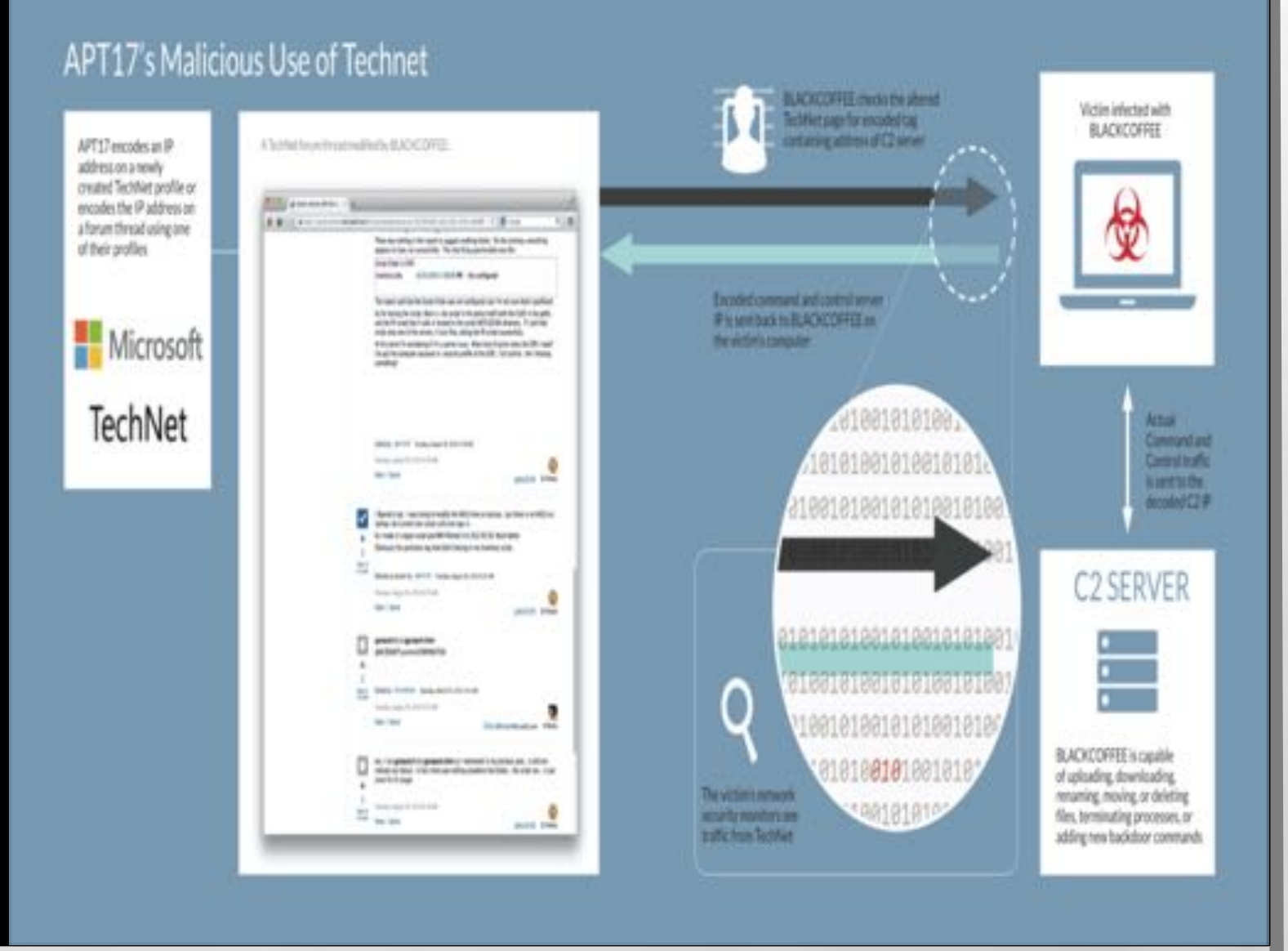


https://www.slideshare.net/qmatheson/security-breach-its-not-if-its-not-when-its-will-you-know

FAMOUS C2 – Deputy Dog / APT17

- BLACKCOFFEE malware
- Leverages 3rd party services
  - MS TechNet!!!
- Didn't compromise TechNet
  - C2 encoded tags in profiles and forum posts!!
- C2 IP sent back to infected hosts

- Operators have their access



https://www.fireeye.com/blog/threat-research/2015/05/hiding_in_plain_sigh.html

DESIGN CONSIDERATIONS – Ground up approach

- What do I want on the target?
  - Remote access
- What does it do once it runs on the target?
  - Escalates privilege and persists
- What kind of file/payload is it?
  - MS Office doc with macro to run PowerShell
- How do I get it to my target?
  - Obstacles of email, network and endpoint defences
- How does it communicate?
  - Heartbeat over HTTP every 15 minutes
  - Domain array

DESIGN CONSIDERATIONS – OPSEC and Security

- **Domains**
  - Good rep and history, frontable
- **Cloud VMs**
  - Multiple providers
- **Monitoring**
  - Email, slack, SMS alerting, log all the things
- **Encryption along the way**
  - How you connect, how targets receive/send data
- **Harden like you would anything on the internet!**
  - Logwatch, fail2ban, go nuts

DESIGN CONSIDERATIONS – Technical Management

- Size and scale
  - How ‘big’ you need it to be
- Automation
  - Script out common builds and features
  - Terraform, C2K ;)
- Adaptable
  - Extending capabilities, rolling new machines and domains
- Access and permissions
  - Controlling access for the red team operators
  - Controlling traffic to and from the infrastructure

DESIGN CONSIDERATIONS – Role based

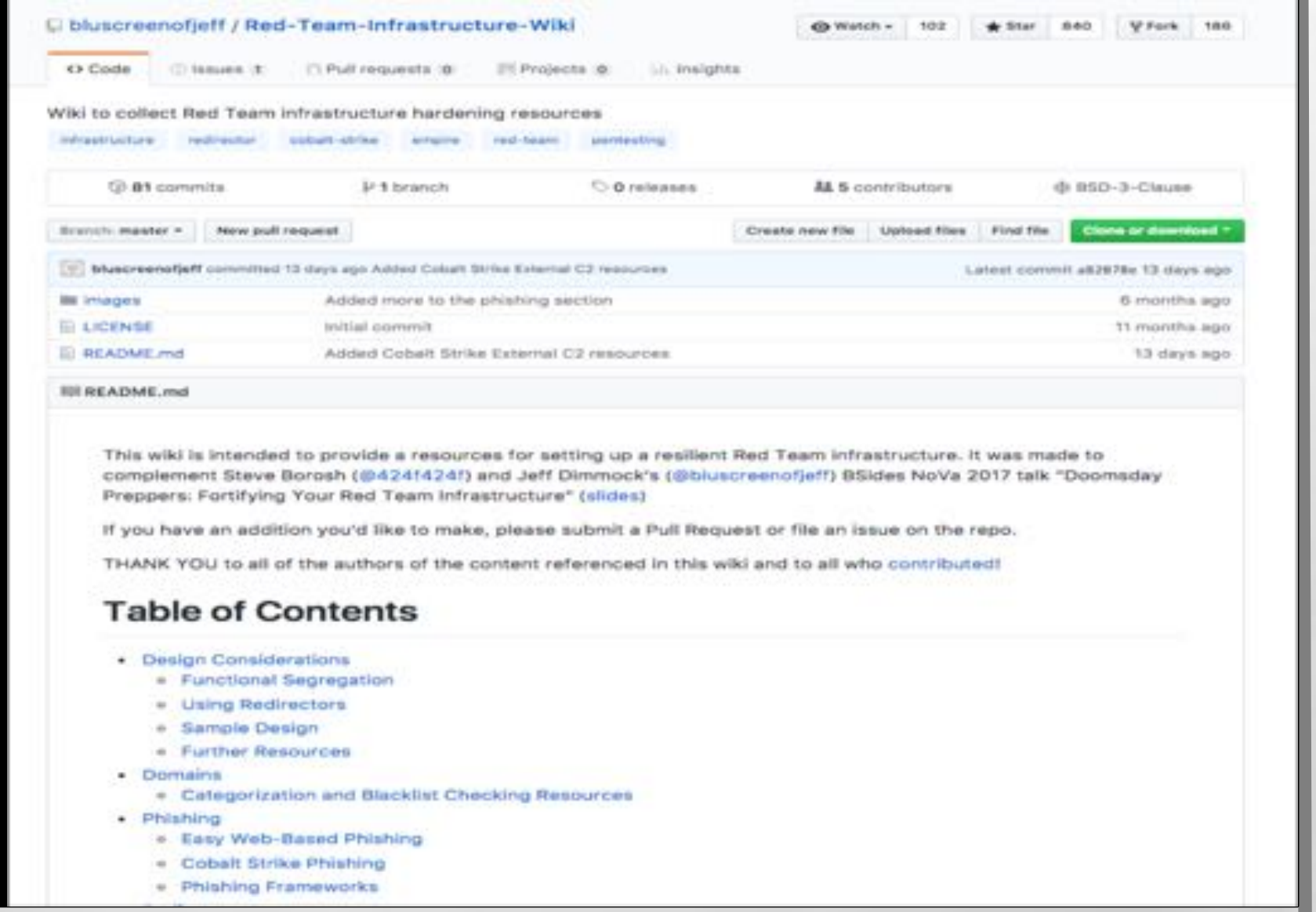
- Phishing instances
  - Servers and email accounts dedicated to phishing operations
- Staging and payload instances
  - Dedicated to hosting initial files/exploits/scripts
- Short-term instances
  - Dedicated to initial foothold or quick access tasks
- Long-term instances
  - Dedicated to stealth, persistence, way back in
- Redirectors
  - Place in front of everything
  - Proxy features is better than true redirection

DESIGN CONSIDERATIONS – Role based (cont.)

- 3rd party services
  - Social Media – Twitter, Telegram, Instagram
  - Email – Gmail, domain-based
  - Cloud Storage – OneDrive, Dropbox, Google Drive
  - Cloud VM – AWS, Digital Ocean
  - *aaS – GCP/GAE, Azure, AWS, Digital Ocean
  - Comms – Slack, Teamspeak, A/V Conference

RED TEAM TREASURE TROVE

- Design considerations
- Domains
- Phishing
- Redirection
- C2 traffic profiles
- 3rd party comms
- Obscuring infra
- Securing infra
- Automation
- Tips



https://github.com/bluscreenofjeff/Red-Team-Infrastructure-Wiki

Automating C2 Builds

- C2K – Command and Control Kit
- Version 1 (working on v2)
- Deploys Digital Ocean droplets
- Sets up Iterm for logging
- Installs Cobalt Strike
- Sets up a firewall
- Custom SSH config
- Adds HTTPS support from Let's Encrypt (thanks Alex ☺)

https://www.blackhillsinfosec.com/build-c2-infrastructure-digital-ocean-part-1/
https://github.com/invokethreatguy/C2K

C2K v2
Preview

LINKS AND SHOUTOUTS

- https://github.com/bluscreenofjeff/Red-Team-Infrastructure-Wiki
- https://github.com/invokethreatguy/C2K
- https://cobaltstrike.com/
- https://fas.org/irp/doddir/dod/jp1.pdf

Special thanks to:

- @bluscreenofjeff
- @itsreallynick
- @malcomvetter
- @sixdub
- @Killswitch_GUI
- @armitagehacker
- @424f424f

THANK YOU