

How misdirection  
can be used to steal  
information without  
being detected

# Deceptive Hacking

Bruce “Grymoire” Barnett  
Magician & Computer Scientist

# Magicians and hackers have a lot in common

- They like to wear black
- They like to “shock” people
- They have Secret Knowledge

**SECRET  
KNOWLEDGE**

**Assumptions**

SECRET  
KNOWLEDGE

= Profit!

Ass...

Assumptions

# Magicians' Arsenal

- Actions
- Props
- People
- Basic Psychology
  - Misdirection
- Advanced Psychological Techniques
- Example of the Magician-Hacker

**ACTIONS**

# Feint

- Pretend to do something, but in reality nothing happens (the hand is empty)
- “A False Show”

Hack: Purposeful delay,  
“Checking your computer for viruses”

# Bluff

- “Feint” but calling attention to the action
- Pretending, when nothing really has happened or will happen.

Hack: “We have detected a virus on your computer”  
Phish, Used in Social Engineering



# Sleight

- ..is a Secret Action, combined with technique
- Sleights are less valuable if they are well known
- Sleights may require years of practice
- Sleights can be worth money
- Sleights are sold with an underground economy
- The best sleights look natural

Hack: Exploit, Buffer Overflow, 0Day. Etc.

# Temps or Timing

- Timing is used to improve deception
- Or make people forget

Hack: Planning ahead, low frequency port scan

**PROPS**

# Gimmick

- A secret device
- Performs some useful function which is unexpected because it is secret

Hack: Rootkit

# Gaff

- A visible device with a secret function

Hack: Easter Egg, backdoor, hidden function

# Fake (Feke)

- A simulation or emulation of a real device

Hack: Trojan Horse, Man-in-the-middle

PEOPLE

# Secret Accomplice, Stooge, Shill, Trusted Insider

- Someone who knowingly helps the attacker
- The victim does not know the insider is an enemy
- The more trusted, the less they are suspected
- “The Enemy of my Enemy” ploy

Hack: Insider Threat, “Friend Request” from stranger



# Unwitting accomplice

- Someone who **unknowingly** helps
  - “Please forward this to everyone you know”
  - “I’m trying to help one of your colleagues who’s visiting us today...”

Hack: Social Engineering

# The Patsy, or “Fall Guy”

- Innocent
- But takes the blame

# BASIC PSYCHOLOGY

# Naturalness – first principle of magic

- Often takes years to perfect some sleights
- Failure to deceive occurs if unnatural
  - i.e. Email from your “friend”
    - The more natural it is, the greater probability of it succeeding
- The Nemesis of the magician is the video recording
  - Forensics

Hack: Everywhere

# And when naturalness isn't possible

- Minimize the unnaturalness as much as possible
  - E.g. Reduce the number of log entries, alerts
  - Make log entries look more natural
    - “AAAAAAAAAAAAAAAAAAAA” => “ProjectDirectory”
    - English Shellcode
- Hide what you can't eliminate
  - E.g. Oracle.com vs Orade.com vs. 0racle.com

Hack: replicate legitimate e-mail, similar domain names

# And when you can't, make the unnatural natural

- Contrived Justification
  - Create a reason for the unnatural action
  - Social Engineering
- Repetition
  - Making the unnatural natural
  - Make a script kiddie attack have the same log pattern as your attack

Hack: Social engineering, port scans with secret attack

# Misdirection

- A way to control attention so they don't see anything unnatural

# Focus their attention away from the unnatural

- Stimulate Interest
  - Attract attention
  - Appeal to their interests
- Distract attention from the unnatural part
  - “OMG! Check out what she is doing in this picture!”

Hack: Spam, thumbnails w/fleshtones



# Directed Misdirection

- Can be caused by an action, or be distracting by its very nature.
- Can cause suspicion
- Attracts interest because of the topic
  - Lady Gaga!/Beyonce!
  - Justin Bieber!
  - Free iPad!
- or uniqueness of the event
  - Setting off a fire alarm
  - Manipulating the HVAC
  - Another attack

# Discovered Misdirection

- Done ahead of time
- Undetermined **when** it happens. However, when discovered, it commands attention.
- If you can control the timing.....

Hack: Discovering a server is infected with a virus

# Constrained Misdirection

- Hacker controls the “view” of the victim
- Getting the victim to remotely access the system that is secretly under control

Hack: Virtual Machine, Man-in-the-middle

# ADVANCED PSYCHOLOGICAL TECHNIQUES

# Encourage false conclusion

- Develop a false premise
  - Provide evidence that the false premise is correct
- Create a false alarm
  - Purposely create a condition that “raised an alarm” and then proves it was wrong. Repeat
  - Causes alarms to be distrusted
- Repetition can be used to encourage a false conclusion
  - A Feint can mask a Sleight.  
Hack: fabricated evidence, EICAR signature in real virus  
Stuxnet?

# Use multiple methods

- Spectator thinks that because a method wasn't used one time, concludes it wasn't used **ever**.
- Allows multiple ways to accomplish the same thing if one method will be detected
- Purposely reveal method to encourage false conclusion

Hack: Multiple 0days in virus

# The Switch

- Let them examine everything before and/or after

Hack: Switching malware in and out, self destruction

# Fake Revelation

- Reveal an inferior method used by “others”
- An example will follow.....



# Conclusion

- By combining the toolkit and psychology of a magician
- With the skills of a hacker
- Creates a new style of hacking
- The goal: undetectable hacking

# THE MAGICIAN-HACKER

# Now let's create a scenario for the magician-hacker

- Company XYZ has valuable IP
- XYZ has excellent security
- Hacker is already inside
- If it is discovered that the IP is stolen, it is worth less \$\$
- Obvious exfiltration attempts would be detected

**WHAT WOULD THE MAGICIAN-HACKER DO?**

# The Patsy

- Unlucky Lucy is administrator of the IP server
- Lucy is smart and alert!
- The magician-hacker has partial access to Lucy's account and places some files in a directory she owns.....
- Which are propagated through the network
- He also creates some web\forum accounts using Lucy's name, and posts outrageous comments
- There is also Innocent Ivy.....

Magic: Discovered Misdirection

# More preparation from the Magician Hacker

- Places an archive of files on a public-facing server in an obscure but publicly accessible URL
- Causes the off-site backup to increase in size each day
- The file Lucy is sharing contains a 0day virus
- Next he generates a faked press release

Magic: Temps/Timing

# “Company XYZ announces Adult Services”



Magic: Creating a False Conclusion

# Then he makes a phone call to Innocent Ivy

- “I found some porn on your web server.”
- Ivy reports this to Chief.
- Magician-Hacker reveals details of “new exploit”

Magic: Bluff, Unwitting Accomplice, Creating a False Conclusion, Reveal an inferior method used by others

# Meanwhile...

- CEO is told of “adult content” found on web site.
- Blogs are now commenting on it
- PR Nightmare begins.
- XYZ published Press Release in response
- CEO wants quick remedy. NOW!
- Virus signatures created by AV companies

## FIRST ROUND OF CHAOS

Magic: Creating a False Alarm, Appeal to their interests



# “Random” e-Mail to Ivy

- “One of your people, Lucy, was bragging about XYZ’s new adult services on a web forum.”
- Rough draft of the forged Press Releases, and jpegs, are also found in Lucy’s Directory
- Ivy reports to Chief, Lucy gets fired
- Virus signatures updated to include new attack

## SECOND ROUND OF CHAOS

Magic: Bluff, Directed Misdirection

# And then...

- Second bogus Press Release published
  - Announces “Public Key,” with URL, signed w/key
  - Reiterates that Company is going into “Adult Services”
  - Claims CEO has “Issues” with company’s new direction
  - Anti-virus finds hundreds of infected files

## THIRD ROUND OF CHAOS

Magic: False Conclusion, misdirection

# The plot thickens

- Infected machines start exporting random data to machines on the Internet
- Anti Virus software detected infected files in Innocent Ivy's directory, but these are different

## FOURTH ROUND OF CHAOS

Magic: Discovered Misdirection, Naturalness, Repetition

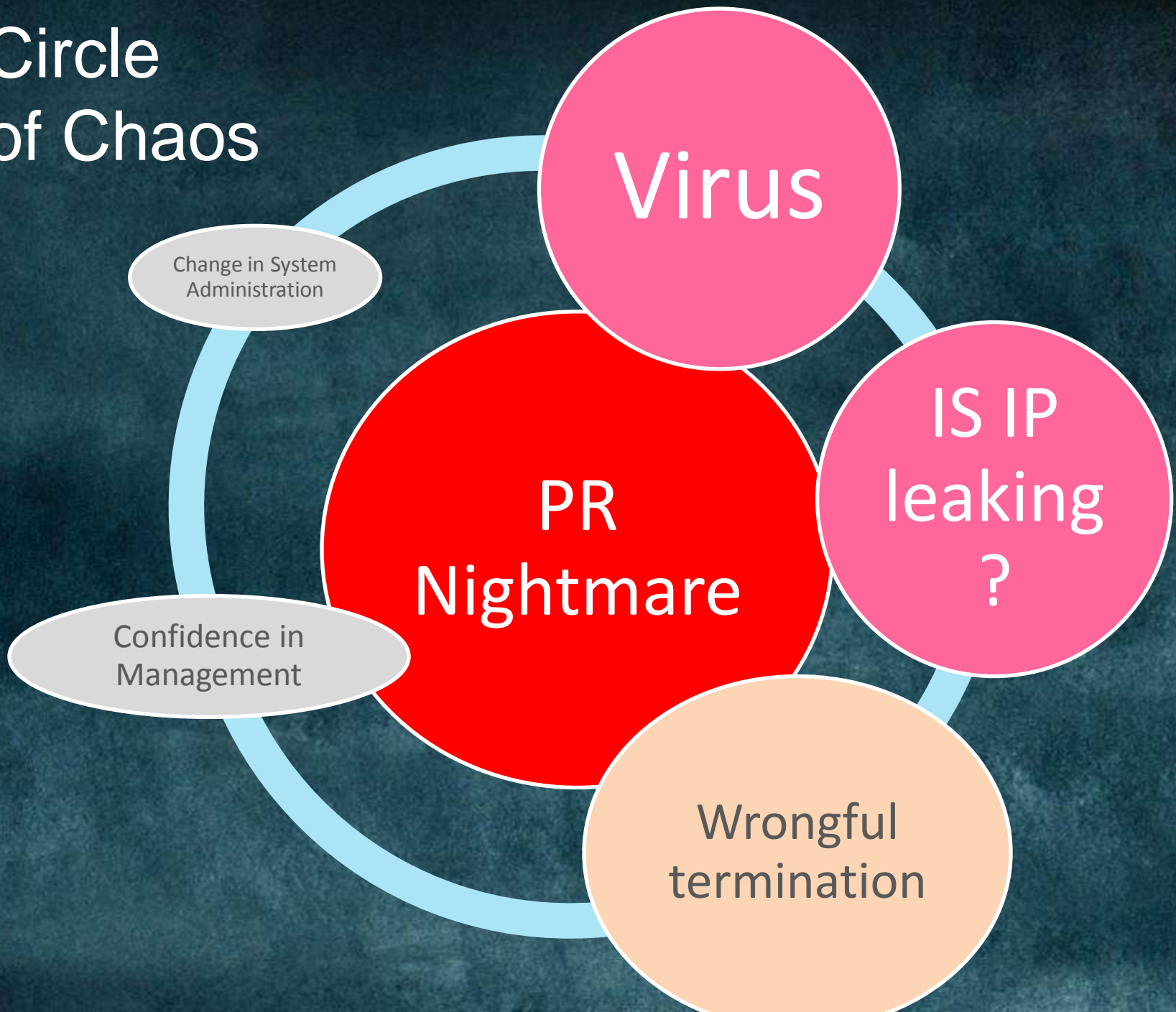
# The Sucker Punch

- Source code of the virus is found in Ivy's Directory
- Also –"Adult" web pages are found
- Drafts of the second forged press release found
- Innocent Ivy fired

## FIFTH ROUND OF CHAOS

Magic: Discovered Misdirection, Naturalness, Repetition

# Circle of Chaos



**TO COMPLETE THE  
ILLUSION**

# The goal of the magician-hacker

- Steal the information from the database
- Don't be detected while it happens
- Be as natural as possible
- Leave no evidence

# What happened

1. A full backup of the server started
2. One small change DNS poisoning
3. When done, all traces of the modifications are removed

Magic: Sleight, Gaff, The Switch, Naturalness



**PROFIT**

# Lessons

- Detecting the magician-hacker requires understanding new actions and motivations
- Unrelated events may not be unrelated
- The obvious answer may not be the right answer
- Increased forensics
- People, like computers, are assets too

Bruce Barnett  
[deception@grymoire.com](mailto:deception@grymoire.com)  
Twitter: @grymoire  
Google+: gplus.to/grymoire

Paper: <http://www.grymoire.com/Deception>