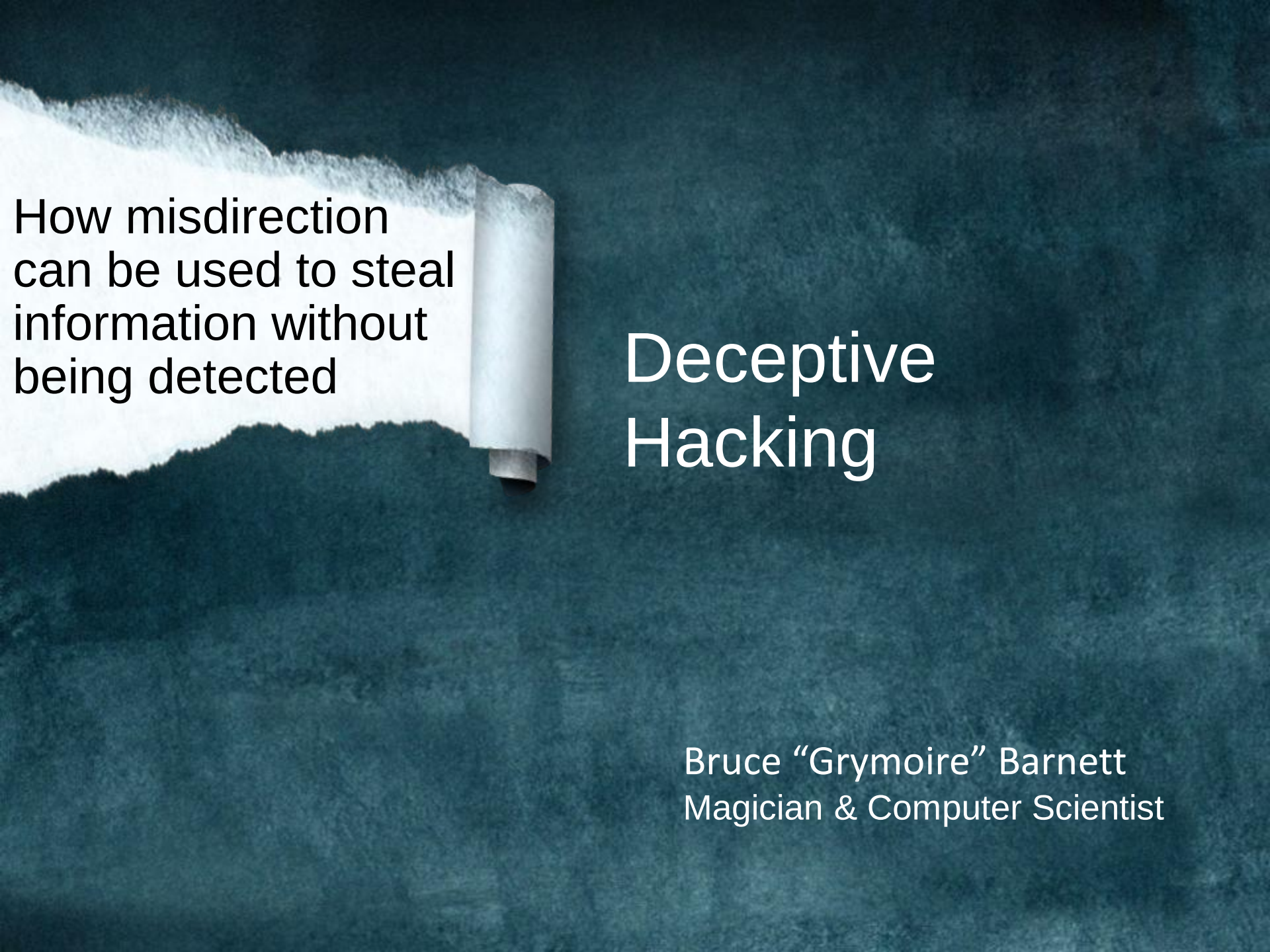
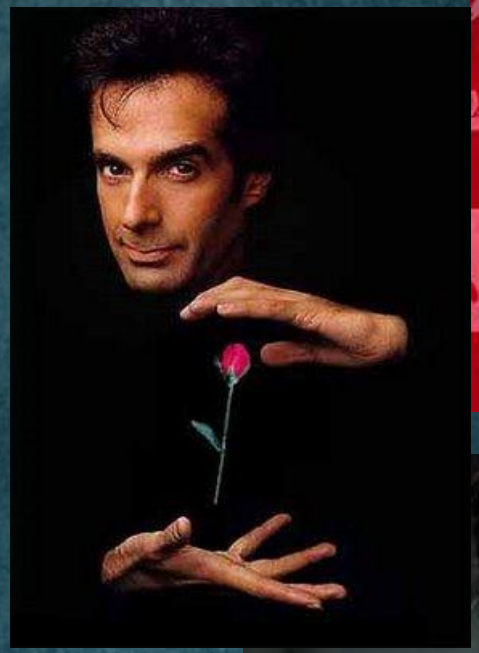
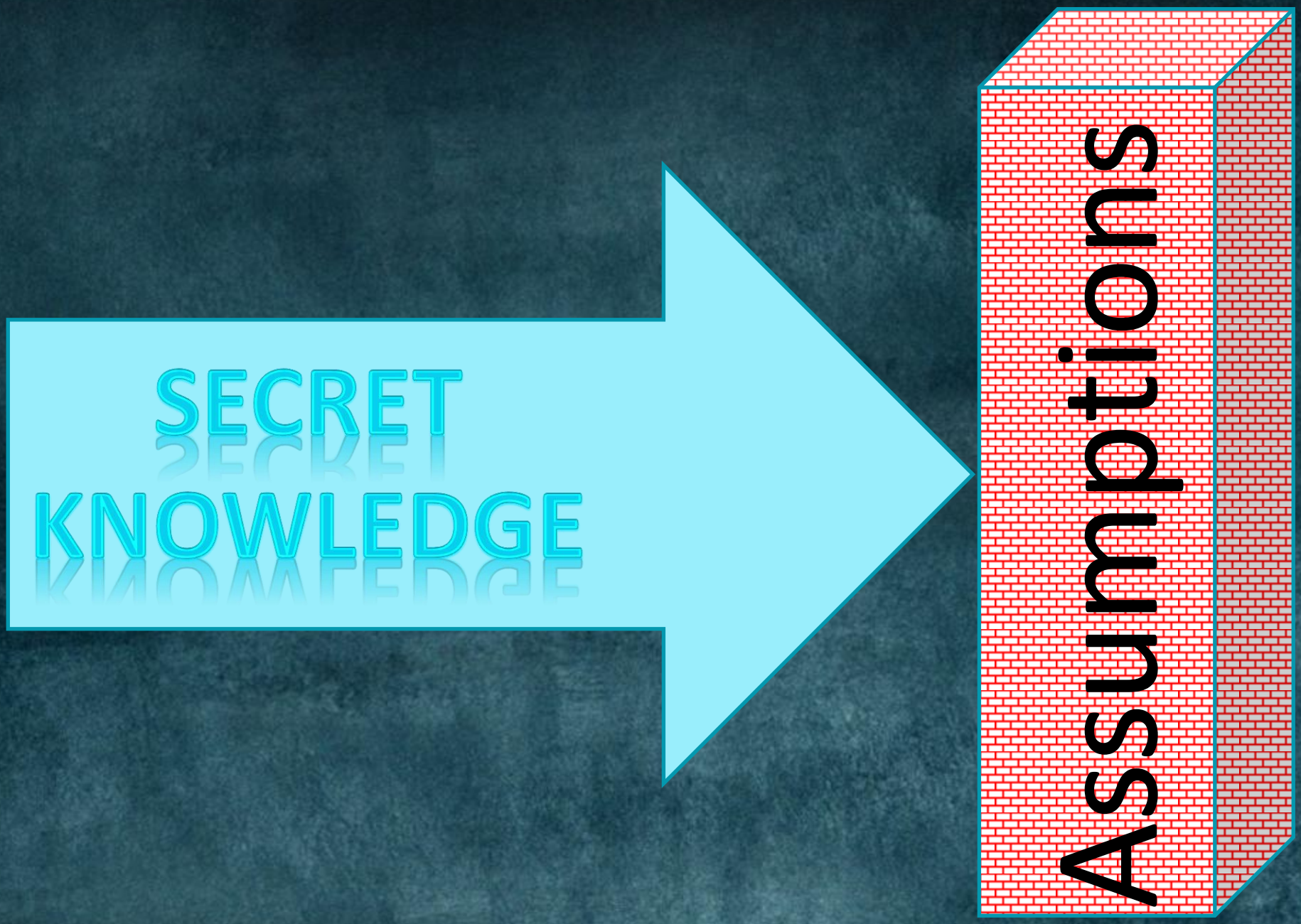
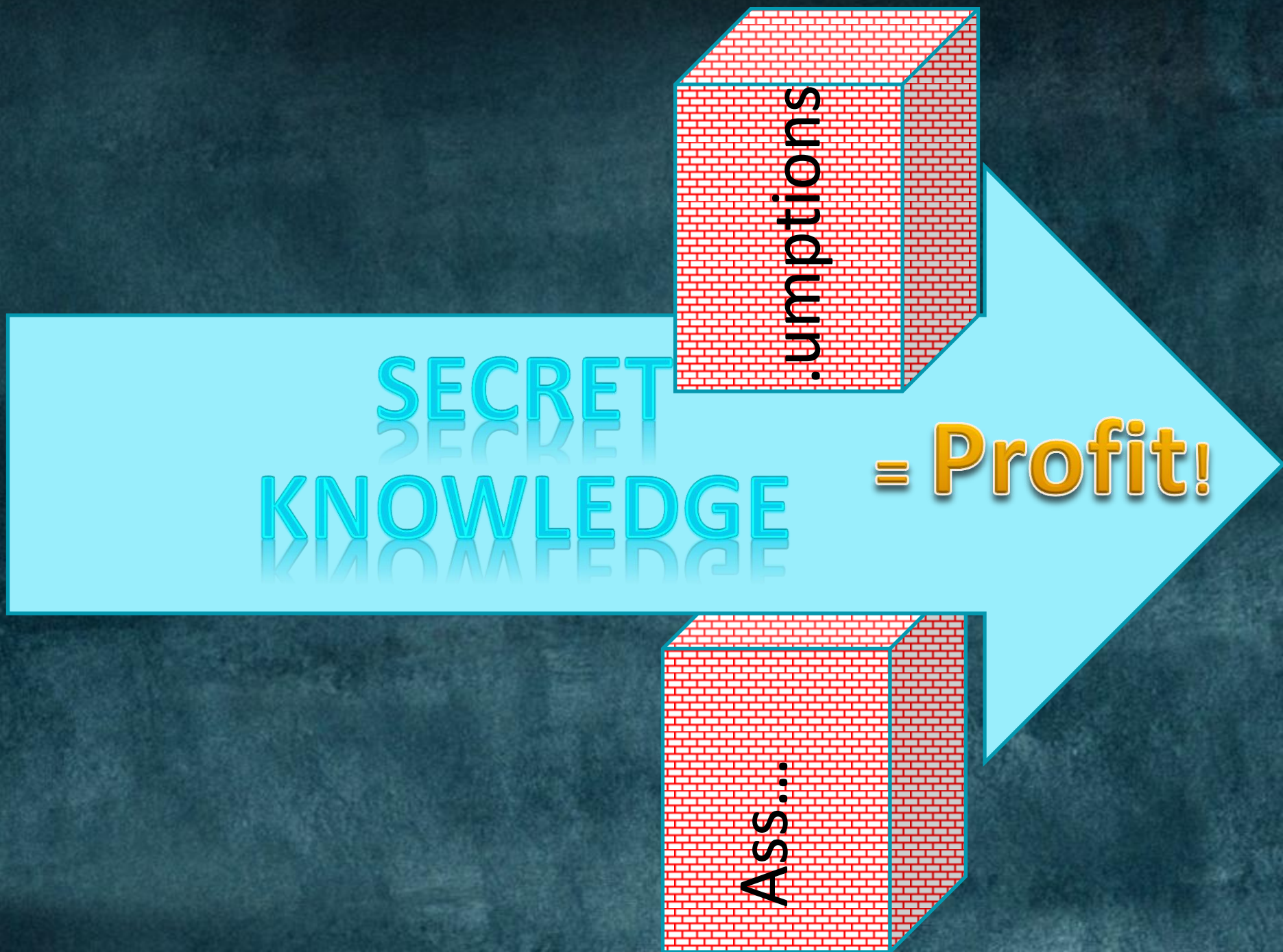

How misdirection can be used to steal information without being detected
Deceptive Hacking
Bruce “Grymoire” Barnett
Magician & Computer Scientist

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!
umptions
Ass...

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 may require years of practice
- Sleights are less valuable if they are well known
- Sleights can be worth money
- Sleights are sold with an underground economy

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

BUT FIRST A DEMONSTRATION

Secret Accomplice, Stooge, Shill

- 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

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
    - "AAAAAAAAAAAAAAAA" => "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 kiddy attack have the same log pattern as your attack

Hack: Social engineering, port scans with secret attack

THE COIN VANISH

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/flesh tones

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

Hack: DarkMarket Sting, 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 modified programs, self destruction

Fake Revelation

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

Summary

- 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…

- 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”

The Daily W

Wednesday, December 1, 2010

XYZ offers Adult Services

In a surprising move, Company XYZ announces that they are going into the Adult Services business. CEO Smith says "That's where the real money is, and Heck, I LOVE pornography"

Analysts admit there is a large underground economy that revolves around pornography. Mr. Smith says µMost of the porn out there is loaded will malware. We want to let the world know that we offer a quality product that is safe to use. No longer do users need to work about viruses, spyware, or other forms of malware.

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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 press release.
- Blogs are now commenting on press release
- XYZ published Press Release in response
- CEO now learns of porn on their website
- Hacker posts screenshots of porn on social sites

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- Blogs are now commenting on press release
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- 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
- Blogs are now commenting on porn content
- 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

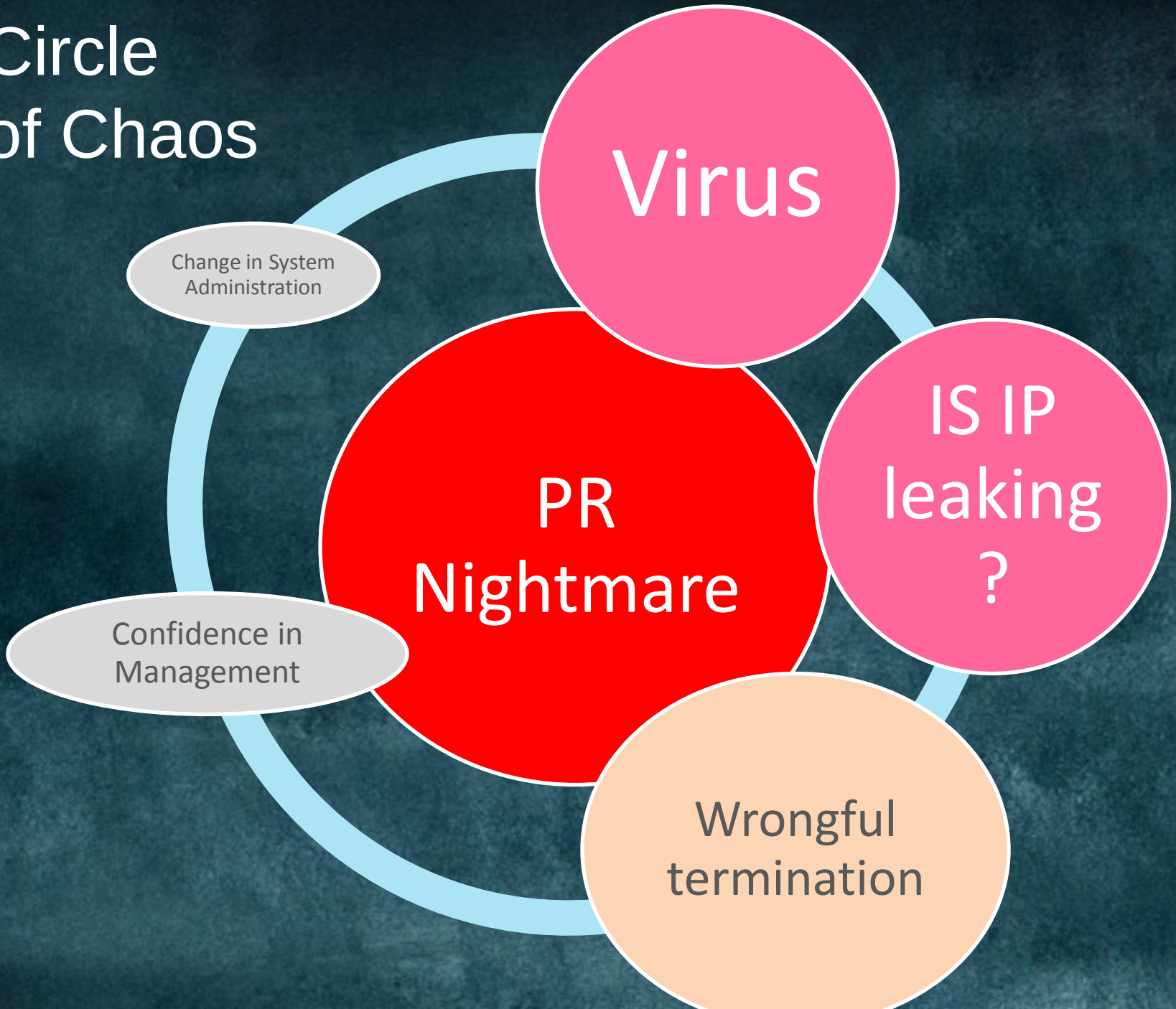
The Sucker Punch

- 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

- Press releases should be signed
- Detecting the magician-hacker requires understanding new actions and motivations
- The obvious answer may not be the correct answer
- Unrelated events may not be unrelated
- Thorough forensics are critical
- People, like computers, are assets too and vulnerable to a Denial of Service

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