slide1

slide2


BRITISH
COLUMBIA
Introduction
Lance Morgan
Lead Investigator
Office of the Chief Information Officer
Investigations and Forensics Unit
2

slide3


BRITISH
COLUMBIA
Investigator
Common Traits
• Unbiased
• Flexible
• Alert / Observant
• Organized
• Creative Thinker
• Tactful / Understanding
• And know when to not be
• Professional and Thorough
3

slide4

Investigation

What are the Key Elements?

- Issue / Complaint / Allegation
- Person(s) of interest
- A definitive resolution

- RESPONISIBILITY / AUTHORITY to investigate

slide5

Investigation

Process Terms

- Reasonable and Probable Grounds
- Mandate and Scope
- Investigative Interview
- Standard of Proof
- Continuity of Evidence
- Exhibit

slide6

Common Investigation Types

- Human Resource
  - Inappropriate Use
- Internal Threat
  - Compromised / Unsophisticated Employee
  - Malicious Employee
- External Threat
  - Nefarious Actors

slide7


BRITISH
COLUMBIA
Conducting an Investigation
Initiation
• Identify Issue
• Identify actors / key assets
• Plan the investigation
• Open Case - Documentation
• Identify Resources required to successfully review the situation
7

slide8

BRITISH COLUMBIA

Conducting an Investigation

Documentation

- Initial Report
- Ongoing Documentation
- Interim Reporting
- Concluding Report
  - Recommendations?

slide9


BRITISH
COLUMBIA
Conducting an Investigation
Documentation - Elements of a report
• Administrative
• Who's involved
• Narrative
• What I did
• Summary
• What I found
• Concluding Report
• Recommendations ?
9

slide10

Conducting an Investigation

Coordination

- Coordinate response
  - Who is part of the investigative team?
  - Who needs to be notified / kept apprised

- Each investigation is unique

slide11

Data Collection

'Evidence'

- Physical assets
  - Devices
- Documentary
  - Logs
- Testimonial
  - Statements

slide12


BRITISH
COLUMBIA
Standard Evidence Principles
• Standard of Proof
• Criminal
• Civil
• Entrapment
• Admissibility of Evidence
• Chain of Custody
• Non Repudiation of Data
12

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BRITISH COLUMBIA

Interviewing

slide14


BRITISH
COLUMBIA
Interviewing
2 Key purposes
• Determine facts
• Detect Deception
14

slide15


BRITISH
COLUMBIA
Interviewing
Determine Facts
Key Questions to ask yourself
• What do I know
• How do I know it
• Why is it important
15

slide16


BRITISH
COLUMBIA
Interviewing
Actors
• Witnesses
• Suspects
• Corroborative persons
16

slide17


BRITISH
COLUMBIA
Interviewing
Traditional
• What Happened?
• Chronological in nature
• Isolates the event in the interviewee
17

slide18

Interviewing

Cognitive

- Re-establish environment, mood, setting & experiences
- Non linear
- Non specific – enjoy the journey …

slide19

slide20

http://www.ctvnews.ca/a-deeper-look-into-the-interrogation-of-russell-williams-1.565832

slide21

Forensic Interview

Used with Suspects

Part 1: Information Gathering

- Understand the circumstances
- Have suspect commit to their "story"

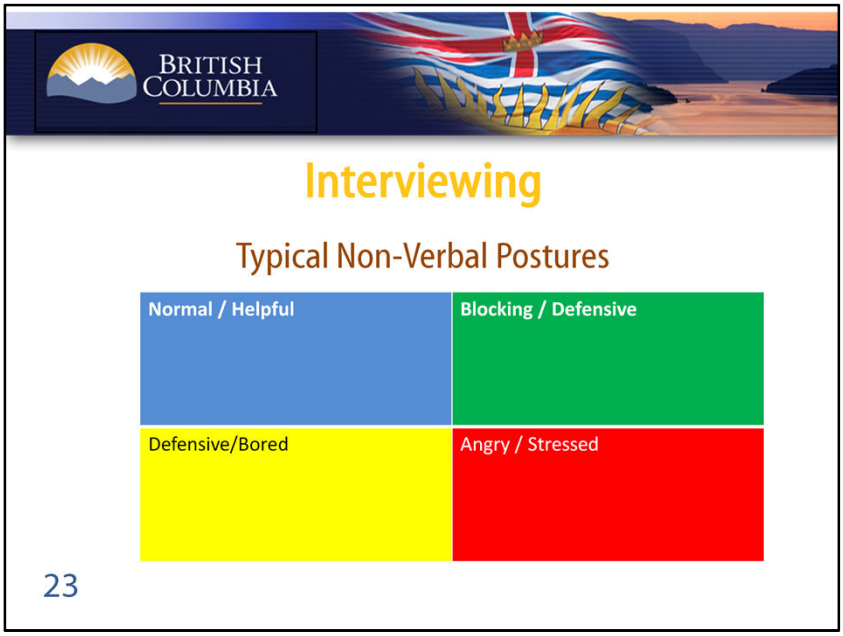
Part 2: Interrogation

- Break down their "story" by identifying inconsistencies, lies, etc.
- Have the suspect provide an admission and confession

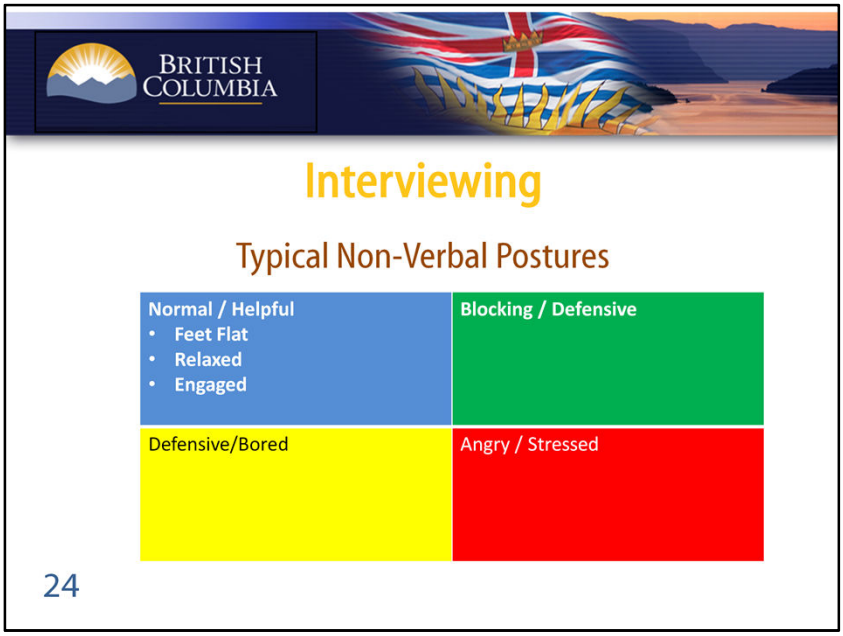
slide22


BRITISH
COLUMBIA
Interviewing
• Various Techniques:
• Open ended
• Goal:
• Develop as clear a picture as possible
22

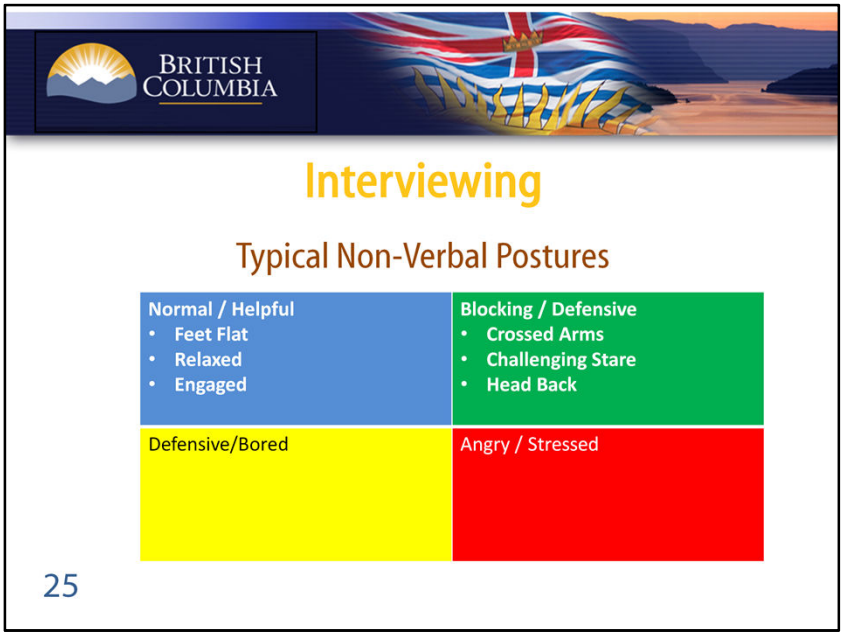
slide23


BRITISH COLUMBIA
Interviewing
Typical Non-Verbal Postures
Normal / Helpful
Blocking / Defensive
Defensive/Bored
Angry / Stressed
23

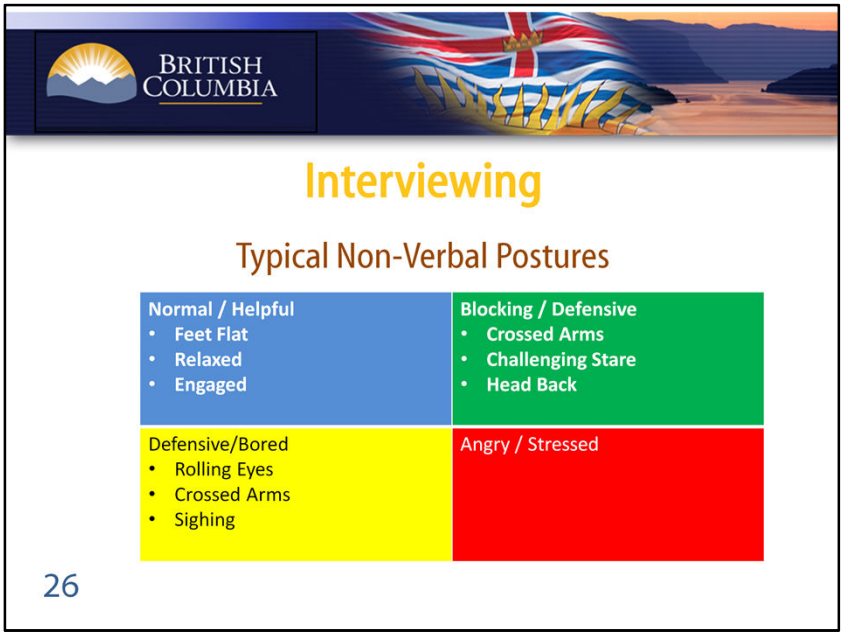
slide24


BRITISH COLUMBIA
Interviewing
Typical Non-Verbal Postures
Normal / Helpful
• Feet Flat
• Relaxed
• Engaged
Blocking / Defensive
Defensive/Bored
Angry / Stressed
24

slide25


BRITISH COLUMBIA
Interviewing
Typical Non-Verbal Postures
Normal / Helpful
• Feet Flat
• Relaxed
• Engaged
Blocking / Defensive
• Crossed Arms
• Challenging Stare
• Head Back
Defensive/Bored
Angry / Stressed
25

slide26


BRITISH COLUMBIA
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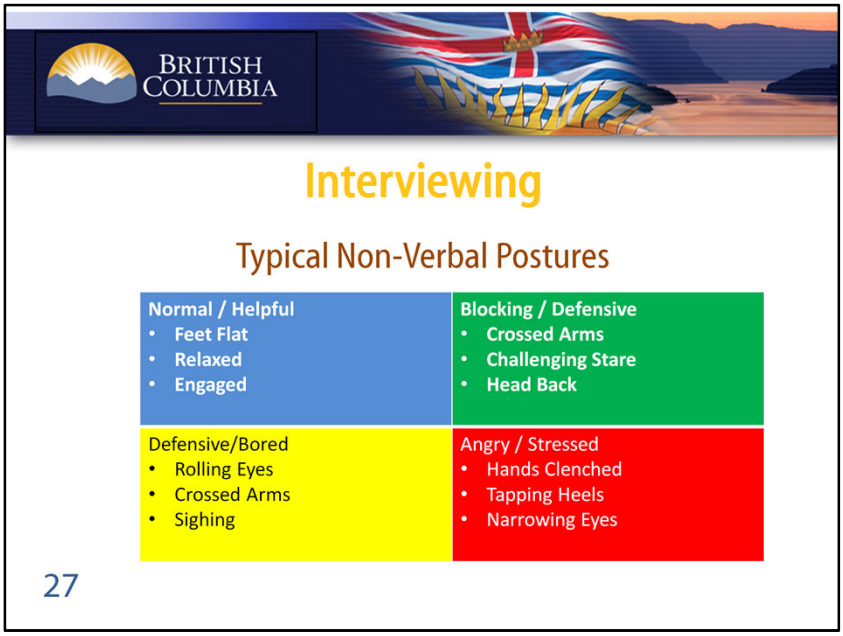
Blocking / Defensive
• Crossed Arms
• Challenging Stare
• Head Back
Defensive/Bored
• Rolling Eyes
• Crossed Arms
• Sighing
Angry / Stressed
26

slide27


BRITISH COLUMBIA
Interviewing
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• Relaxed
• Engaged
Blocking / Defensive
• Crossed Arms
• Challenging Stare
• Head Back
Defensive/Bored
• Rolling Eyes
• Crossed Arms
• Sighing
Angry / Stressed
• Hands Clenched
• Tapping Heels
• Narrowing Eyes
27

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BRITISH
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Common Investigation Types
• Human Resource
• Inappropriate Use
• Threatening Behaviour
• Misuse of Time
• Bringing employer into disrepute / exposure of data
• Copyright Infringement
28

slide29


BRITISH
COLUMBIA
Common Investigation Types
• Internal Threat
• Unsophisticated Employee
• Compromised Employee
• Malicious Employee
• Key loggers / introduction of malware
• Data Leak
• Hacking
• Social Engineering
• Hacktivists
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slide30


BRITISH
COLUMBIA
Common Investigation Types
• External Threat
• Nefarious Actors
• Hackers, Phishers, Hacktivists
• Social Engineers (Mitnick)
30

slide31

http://www.azfamily.com/news/Tempted-to-vent-about-work-online-You-could-get-fired-188133881.html

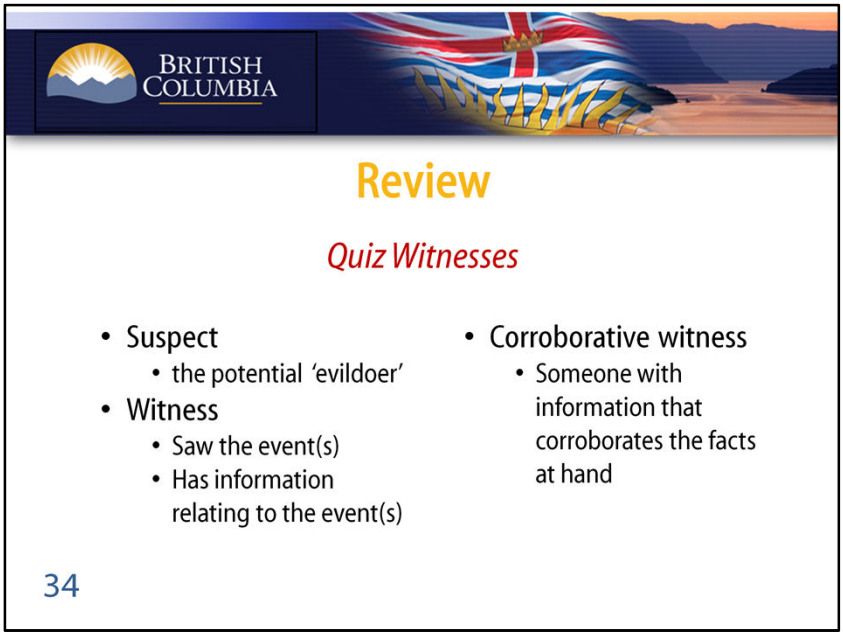
slide32

slide33

Review

- Types of Actors?
  - Suspects
  - Witnesses / Corroborative Witnesses
- Types of Data Sources (Evidence)
  - Logs
  - Devices
- Documentary Requirements
  - Reports / Communications Trail

slide34



Review

Quiz Witnesses

- Suspect
  - the potential 'evildoer'
- Witness
  - Saw the event(s)
  - Has information relating to the event(s)
- Corroborative witness
  - Someone with information that corroborates the facts at hand

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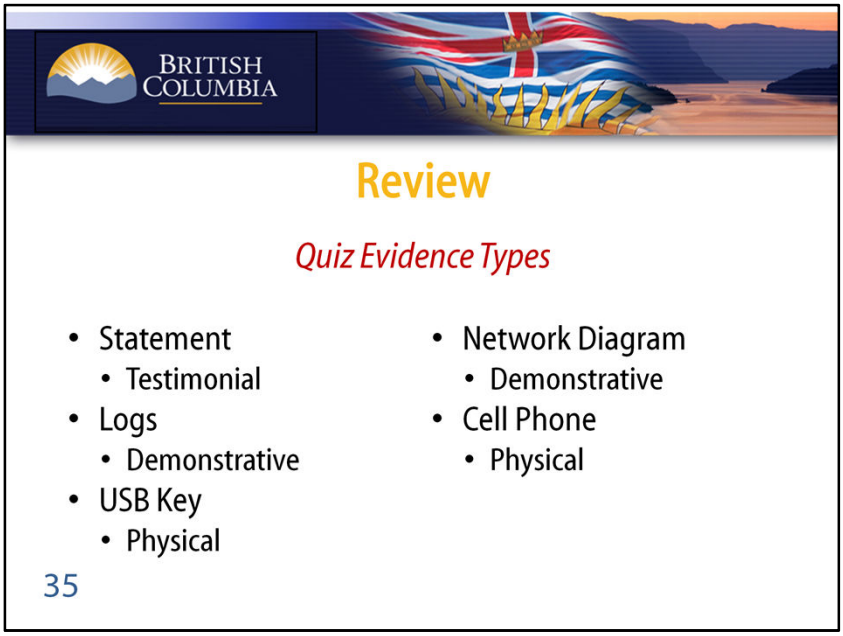
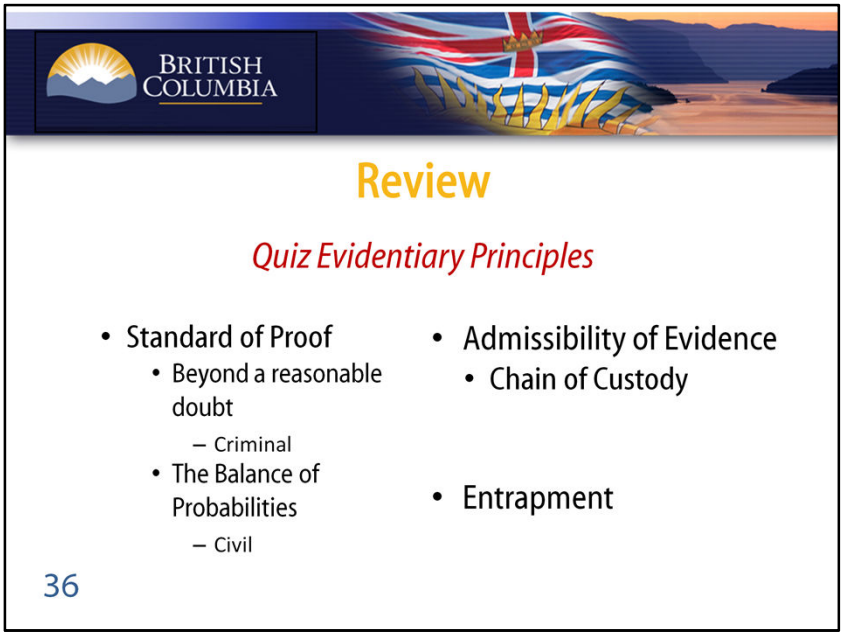

BRITISH
COLUMBIA
Review
Quiz Evidence Types
• Statement
• Testimonial
• Logs
• Demonstrative
• USB Key
• Physical
• Network Diagram
• Demonstrative
• Cell Phone
• Physical
35

slide36



Review

Quiz Evidentiary Principles

- Standard of Proof
  - Beyond a reasonable doubt
    - Criminal
  - The Balance of Probabilities
    - Civil
- Admissibility of Evidence
  - Chain of Custody
- Entrapment

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BRITISH COLUMBIA

Review

Documentation - Elements of a report

- Administrative
  - Who's involved
- Narrative
  - What I did
- Summary
  - What I found
- Concluding Report
  - Recommendations ?

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BRITISH
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Current Events
It's a wild wild world....
• Hacktivists
• Script Kiddies
• Useful idiots….
• Hackers
• Criminal Elements
• National Actors
• Co-opted elements.
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Espionage / Exploits

Nothing New

- Social Engineering
- USB Techniques
- Flame

slide40


BRITISH
COLUMBIA
Espionage / Exploits
Nothing New
• Social Engineering
• Officers, Agents & Spies
• Covert agendas
• Not what it appears to be
• Prays on human nature to be 'helpful'
40

slide41

Espionage / Exploits

Nothing New

- USB Techniques
  - Stuxnet
  - Key loggers
  - Other viral implants
  - Data Extraction

slide42

Espionage / Exploits

Nothing New

- Flame
  - Data Extraction
  - Network exploitation
  - High degree of sophistication
- Mini-Flame
  - Follow on for precision strikes

slide43

http://www.youtube.com/watch?v=M4V3BwTlN0A
RU Television

http://www.youtube.com/watch?v=M4V3BwTlN0A
47 MInute
US Naval War College ILD 2012 Panel Discussion Cyber Attacks: The Law
Published on Oct 10, 2012
International Law Conference, U.S. Naval War College
June 25-27, 2012

http://www.youtube.com/watch?v=oz_NPGqNlqo
PBS Great Decisions 2012 Excerpts: How to Protect Against Cyber Attacks
Published on Jun 11, 2012
From Great Decisions 2012, Episode 4 "Cybersecurity: Defense in the Digital Age" - Originally aired on PBS
As cyber attacks continue to occur at a breakneck pace, is the U.S. at risk?
Category
News & Politics
License
Standard YouTube License
http://www.youtube.com/watch?v=3V8w5yDEY84

Published on Oct 1, 2012
Posted 9/22/2012

slide44

'Cyber War'

Future is Now

- Estonia 2007
  - Strictly non kinetic – Infowar
  - Used by 'non-national' forces against Estonian Government and Financial targets
  - Suspected involvement of Russian Authorities but no proof

slide45


BRITISH
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'Cyber War'
Future is Now
• Georgia 2008
• Supported Kinetic activity
• Active DDOS against Georgian Government Sites
• Experts believe involvement of Russian Military Intelligence and Federal Security highly likely.
45

slide46


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'Cyber War'
Future is Now
• South Korea 2011
• 10 Days of Rain
• Brilliant use of cultural knowledge in creating the exploit tool
• Major assault against S. Korean Government sites and US Forces Korea network
• Self destruct feature
• Very sophisticated for a 'simple' DDOS strike
– A test for something later????
46

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'Cyber War'

Future is Now

- Iran Stuxnet / Duqu
  - The next level
    - Multi-nation effort – ***Operation Olympic Games***
    - Highly specific
    - Huge Effort
    - An example of asymmetric warfare
- Supply Chain issues

slide48

slide49

http://threatpost.com/en_us/blogs/malware-infects-two-power-plants-lacking-basic-security-controls-011413

http://www.theregister.co.uk/2008/01/11/tram_hack/

STUXNET
Cyber Defence Units Announced Recently:

India
Turkey
Brazil

Romania recently attacked through Red October vulnerability

slide50

Privacy and Investigations

Regina v. Cole

- Unreasonable Search and Seizure
  - Device was provided for personal use as well
  - Device transferred to Law Enforcement
- Employer Policies of Use must be clear
- Personal Use allowances invite risk and uncertainty

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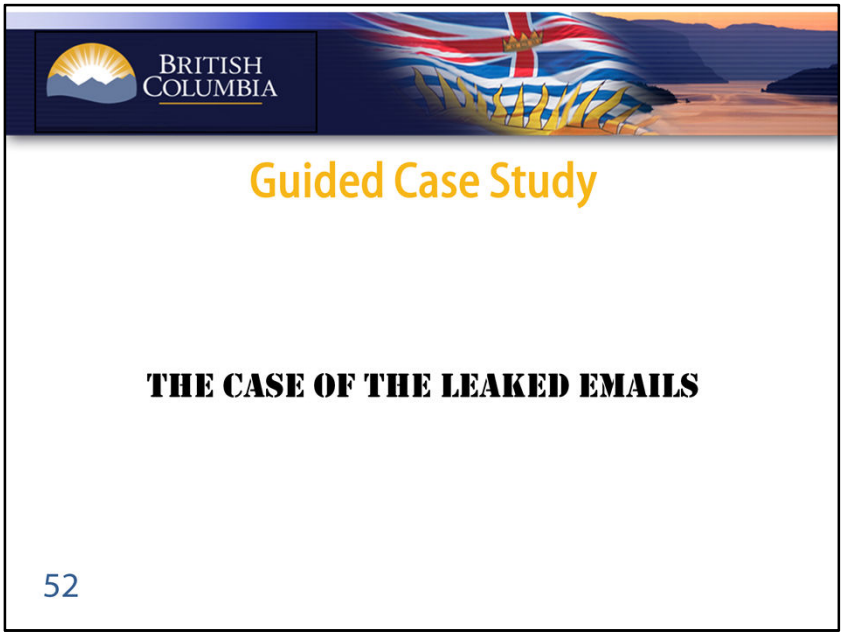
BRITISH
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Guided Case Study
THE CASE OF THE LEAKED EMAILS
52

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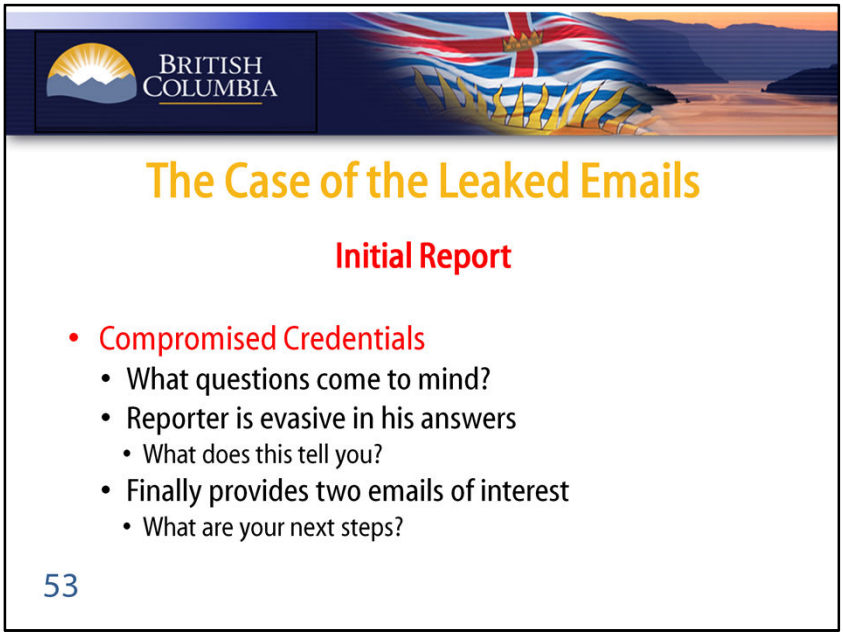
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The Case of the Leaked Emails
Initial Report
• Compromised Credentials
• What questions come to mind?
• Reporter is evasive in his answers
• What does this tell you?
• Finally provides two emails of interest
• What are your next steps?
53

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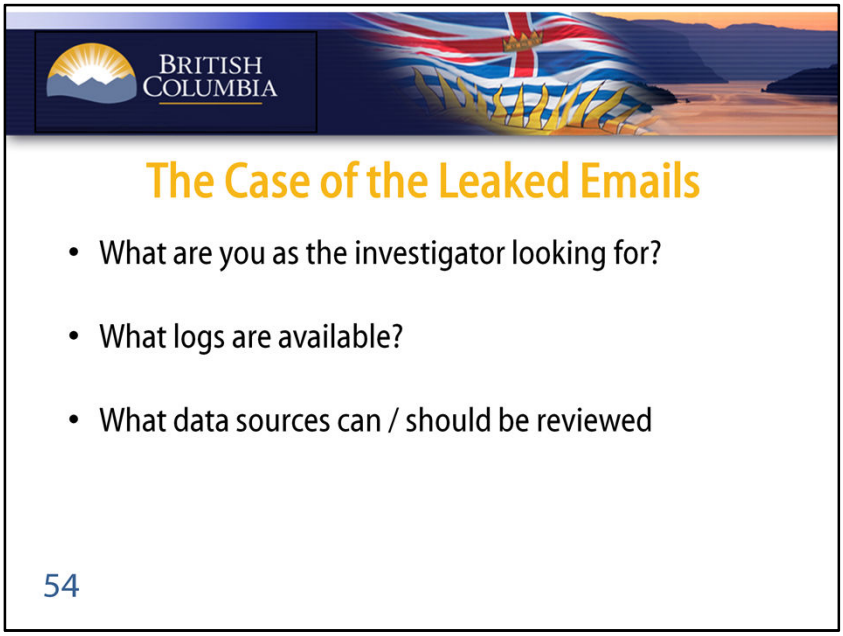
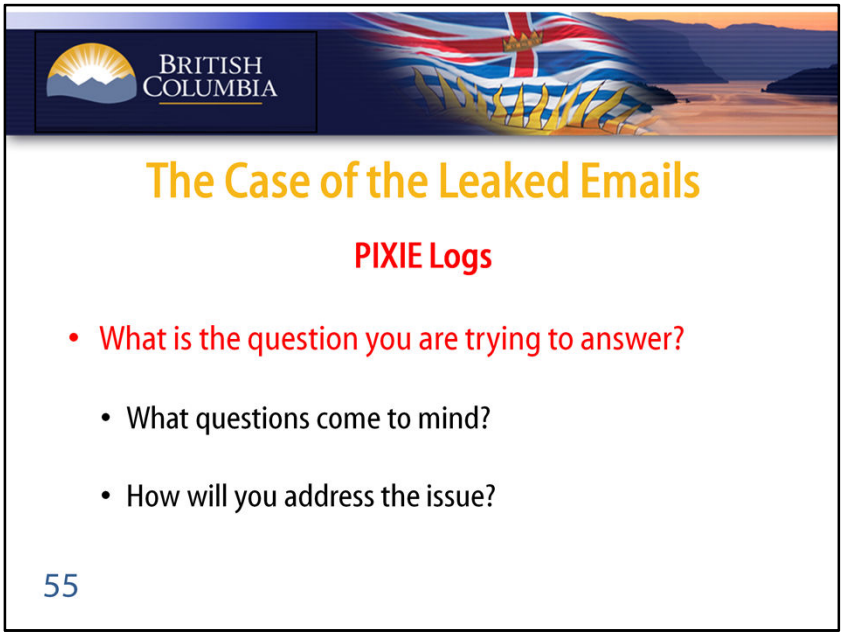


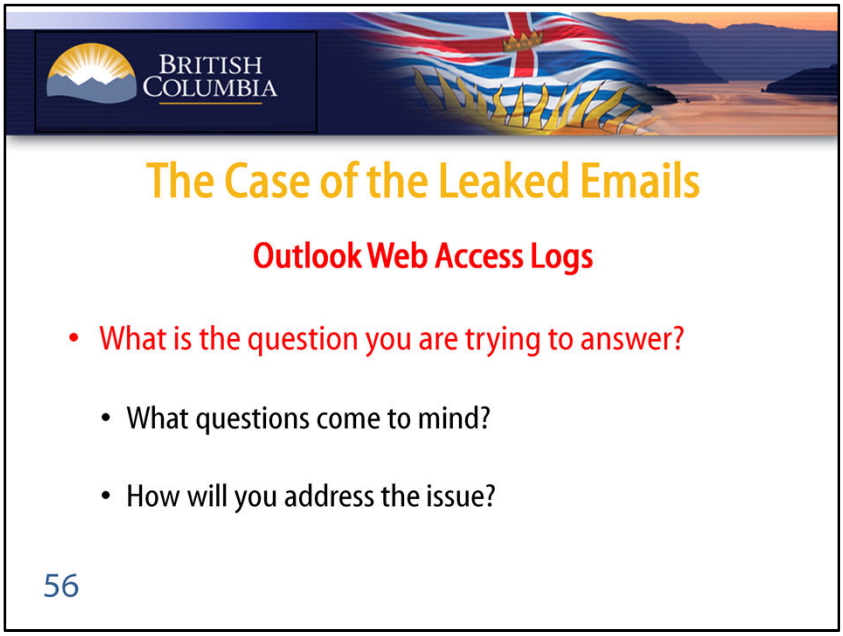
The Case of the Leaked Emails

- What are you as the investigator looking for?
- What logs are available?
- What data sources can / should be reviewed

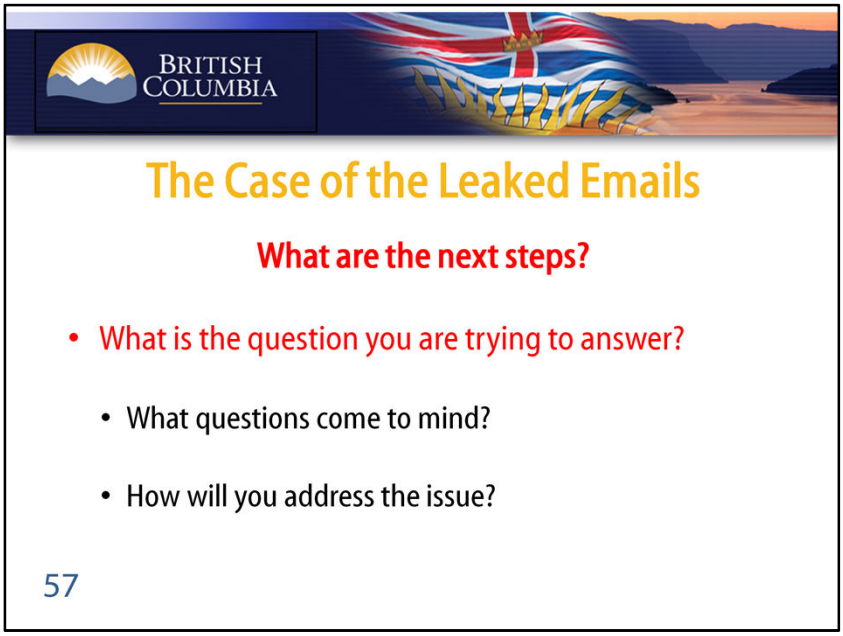
slide55


BRITISH
COLUMBIA
The Case of the Leaked Emails
PIXIE Logs
• What is the question you are trying to answer?
• What questions come to mind?
• How will you address the issue?
55

slide56


BRITISH
COLUMBIA
The Case of the Leaked Emails
Outlook Web Access Logs
• What is the question you are trying to answer?
• What questions come to mind?
• How will you address the issue?
56

slide57


BRITISH
COLUMBIA
The Case of the Leaked Emails
What are the next steps?
• What is the question you are trying to answer?
• What questions come to mind?
• How will you address the issue?
57