NCDIT Cyber Symposium
Emerging Cyber Threats

LTC Seth Barun, Chief of Cyber Operations, NCNG
SPC Isaac Marshall, Penetration Testing Division, NCNG

Agenda

- JCTF Overview
- CSRF Overview
- Cyber Threats
- Prevention Steps
- Open Forum

JOINT CYBER SECURITY TASK FORCE (JCTF)

EO 254

- Formerly established the Joint Cybersecurity Task Force
- Members include:
  - NC Department of Information Technology/Enterprise Security and Risk Management Office
  - NC Division of Emergency Management
  - NC National Guard
  - NC Local Government Information Systems Association Cybersecurity Strike Team
- Partners include:
  - NC Information Sharing and Analysis Center
  - Federal Bureau of Investigation
  - United States Secret Service
  - Other federal agencies, NC state agencies, or other stakeholders as needed

NC JCTF

Upon receiving a report of a significant cyber incident, the NC JCTF will establish a scoping call with the impacted entity to address the following high-level activities:

- Incident Response. This includes conducting forensics to identify root-cause, damage assessment and mitigation, and coordination with law enforcement activities as needed. Lastly information sharing of indicators of compromise.

- Recovery Response. This effort could include establishing best practice recovery methods, system hardening, restoration of services and infrastructure rebuild.

CYBER SECURITY RESPONSE FORCE (CSRF)

Mission

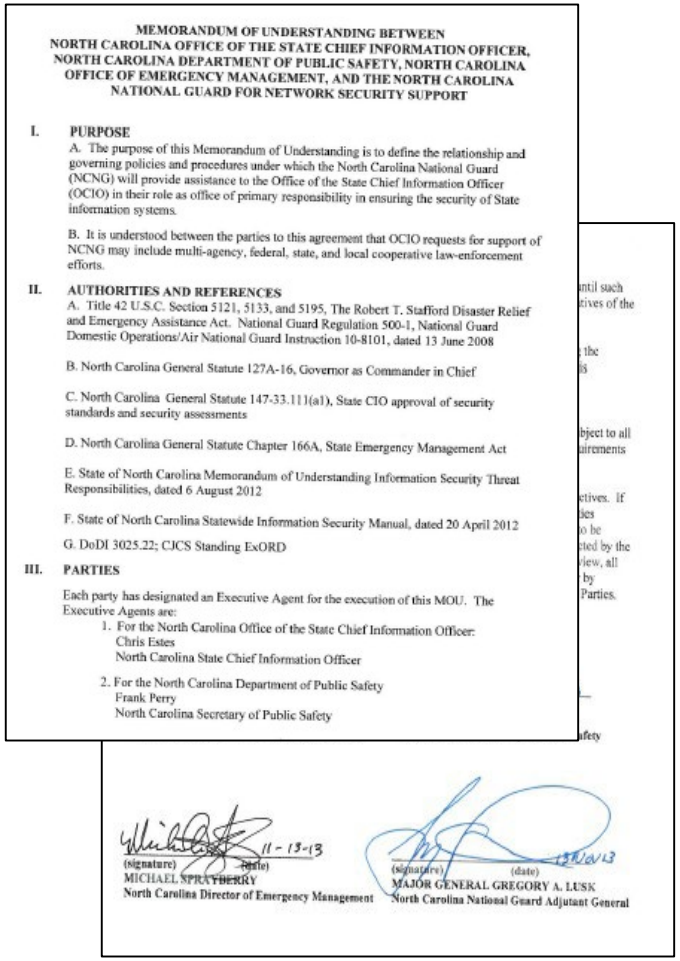
Conduct Defensive Cyberspace operations to support mission requirements as directed by the TAG or Governor.

- Federal Mission: Provide Defensive Cyberspace Operations capabilities on DODIN and supporting Critical Infrastructure
- State Mission: Provide cybersecurity assistance to State, Local, and Critical Infrastructure providers

NCNG and State of NC cyber partnership

- (2013) Fully executed Network Security Support MOU between TAG and State of NC:
  - NC Chief Information Officer
  - NC Department of Public Safety
  - NC Office of Emergency Management

- Agreement sets forth framework to provide:
  - Cyber Prevention (Policy \ Standards \ Compliance Gap Analysis)
  - Cyber Assessment (Environment \ Culture \ Vulnerability Assessment)
  - Incident Response (Cyber Response Force)
  - Forensics (Cause of Attack, methodology)



MEMORANDUM OF UNDERSTANDING BETWEEN
NORTH CAROLINA OFFICE OF THE STATE CHIEF INFORMATION OFFICER, NORTH CAROLINA DEPARTMENT OF PUBLIC SAFETY, NORTH CAROLINA OFFICE OF EMERGENCY MANAGEMENT, AND THE NORTH CAROLINA NATIONAL GUARD FOR NETWORK SECURITY SUPPORT

I. PURPOSE

A. The purpose of this Memorandum of Understanding is to define the relationship and governing policies and procedures under which the North Carolina National Guard (NCNG) will provide assistance to the Office of the State Chief Information Officer (OCIO) in their role as office of primary responsibility in ensuring the security of State information systems.

B. It is understood between the parties to this agreement that OCIO requests for support of NCNG may include multi-agency, federal, state, and local cooperative law-enforcement efforts.

II. AUTHORITIES AND REFERENCES

A. Title 42 U.S.C. Section 5121, 5133, and 5195, The Robert T. Stafford Disaster Relief and Emergency Assistance Act. National Guard Regulation 500-1, National Guard Domestic Operations/Air National Guard Instruction 10-8101, dated 13 June 2008

B. North Carolina General Statute 127A-16, Governor as Commander in Chief

C. North Carolina General Statute 147-33.111(a1), State CIO approval of security standards and security assessments

D. North Carolina General Statute Chapter 166A, State Emergency Management Act

E. State of North Carolina Memorandum of Understanding Information Security Threat Responsibilities, dated 6 August 2012

F. State of North Carolina Statewide Information Security Manual, dated 20 April 2012

G. DoDI 3025.22; CJCS Standing ExORD

III. PARTIES

Each party has designated an Executive Agent for the execution of this MOU. The Executive Agents are:

1. For the North Carolina Office of the State Chief Information Officer:
   Chris Estes
   North Carolina State Chief Information Officer

2. For the North Carolina Department of Public Safety
   Frank Perry
   North Carolina Secretary of Public Safety

11-13-13
(signature) (date)
MICHAEL SPRAYBERRY
North Carolina Director of Emergency Management

(signature) (date)
MAJOR GENERAL GREGORY A. LUSK
North Carolina National Guard Adjutant General

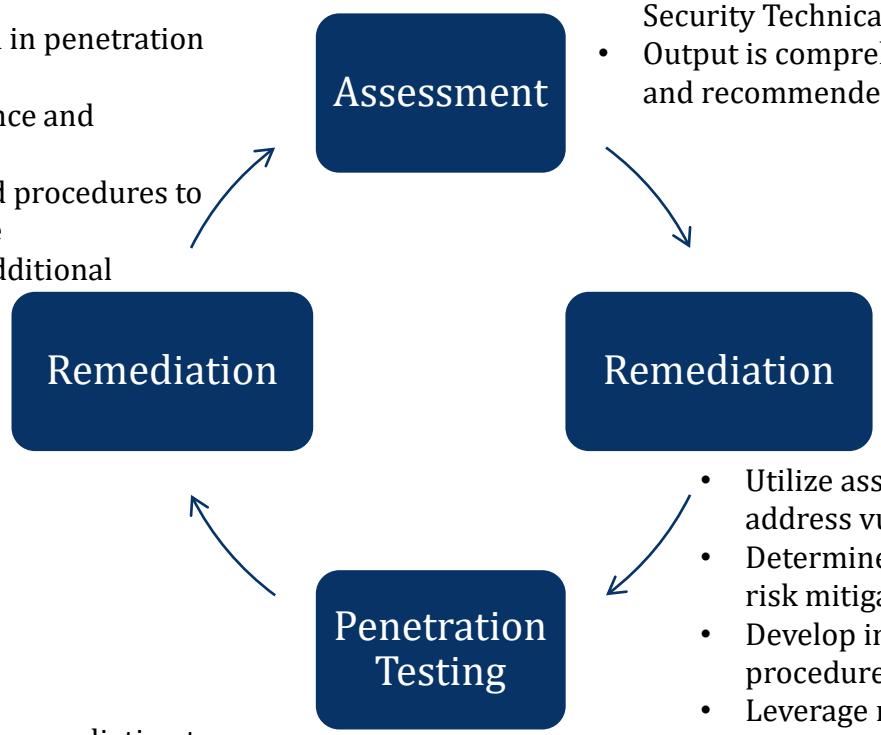
NCNG CSRF - Lines of Effort

- **Cyber Hygiene Assessment**
- **Penetration Testing**
- **Continuous Monitoring**
- **Training and Outreach**
- **Quick Reaction Support (Cyber QRF)**
- **Forensics Support and Malware Analysis**

These services are offered free of charge to Critical Infrastructure Partners. That means most of you!

Strategy - Cyber Hygiene Cycle

- Assessment of information security program, environmental factors, and technical area review
- Purpose is to identify potential gaps in coverage as well as provide baseline of improvement recommendations
- Conducted using industry best practices and DOD Security Technical Implementation Guidelines (STIGs)
- Output is comprehensive report outlining vulnerabilities and recommended solutions



- Address vulnerabilities outlined in penetration testing report
- Identify additional risk acceptance and document mitigation strategy
- Evaluate processes, policies, and procedures to ensure comprehensive coverage
- Leverage report to determine additional resource requirements

- Utilize assessment report to prioritize and address vulnerabilities
- Determine acceptable risk levels and document risk mitigation strategy
- Develop internal processes, policies and procedures to improve security posture
- Leverage report to determine additional resource requirements

- Validate the steps taken during remediation to ensure appropriate resolution
- Identify additional areas of concern including user awareness and network monitoring capability
- Output is comprehensive report detailing actions taken and recommended solutions

CYBER THREATS

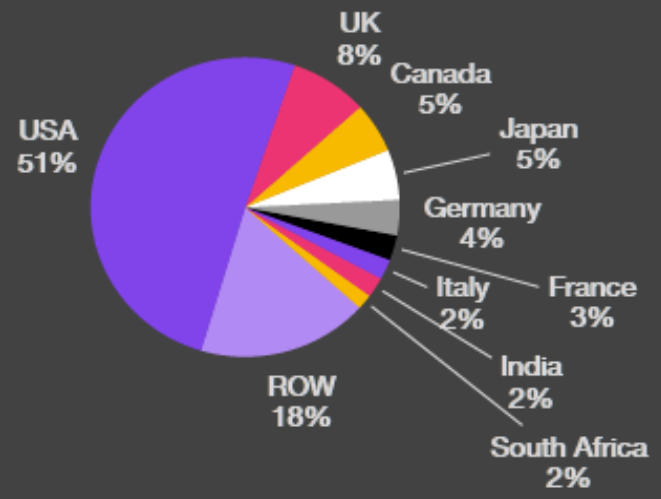
Shodan Demo

- Avenues of Attack
  - RDP
  - FTP
  - SMB
- Video Feeds
- ICS/SCATA search

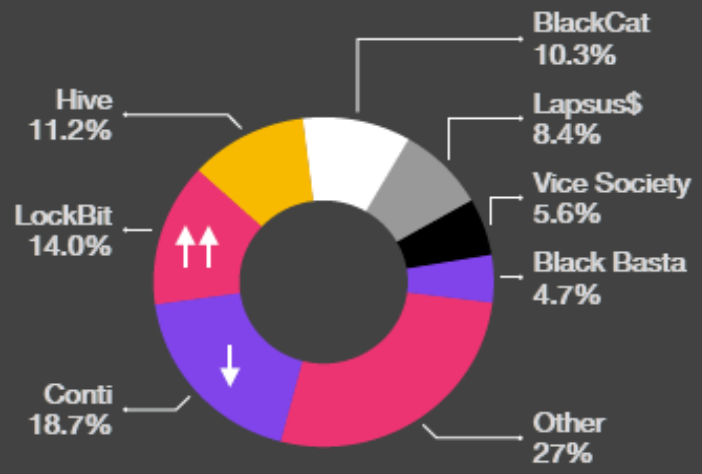
Who is the Real Target?

- Targets of opportunity
- Open-source tools make finding vulnerabilities and exploits easier and easier
- Cyber gangs can be sophisticated organizations with interpreters, lawyers, and coders
- Criminal gangs use Ransomware-as-a-Service to rent software and infrastructure for attacks
- Attacks are scripted and often are “fire and forget” until they gain access

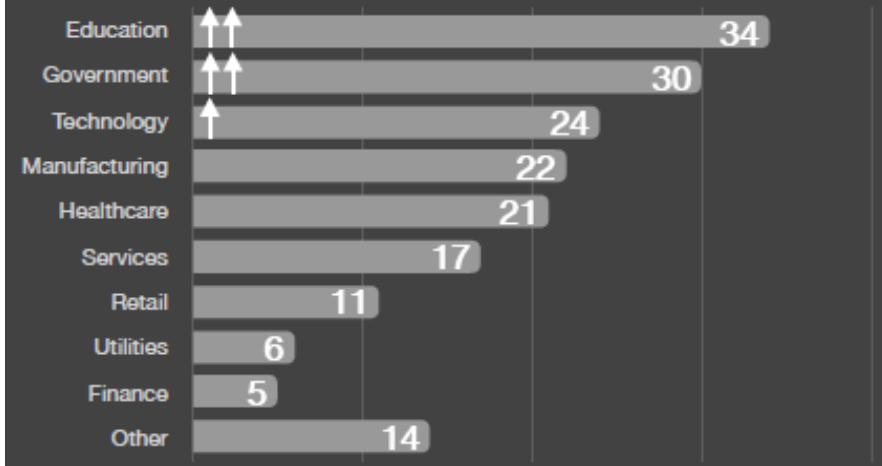
Ransomware by Country



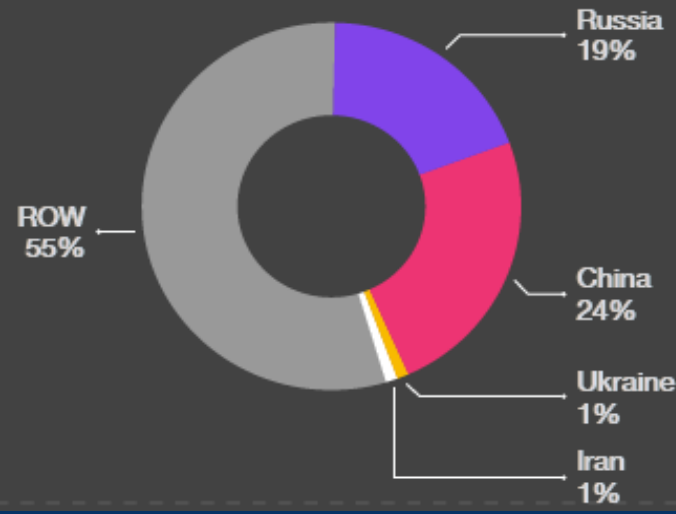
Ransomware by Variant



Ransomware by Industry



Ransomware Exfiltration Country



Cyber Crime Impact

- 2.4 million North Carolina residents impacted by cyber-attacks in 2021
- In the past 18 months, cyber-attacks cost NC citizens and businesses nearly $92B
- A cyberattack occurs every 39 seconds
- Over 50% of devices that got infected were re-infected in the same year
- Average Ransomware demand rose to $338,669 in 2020
- Average ransomware attack cost company $5M
- 2020 survey of 5000 IT Managers found 51% had been impacted by Ransomware
  - Criminals succeeded in encrypting data in 73% of the attacks
- On average, it takes 228 days to identify cyber breach

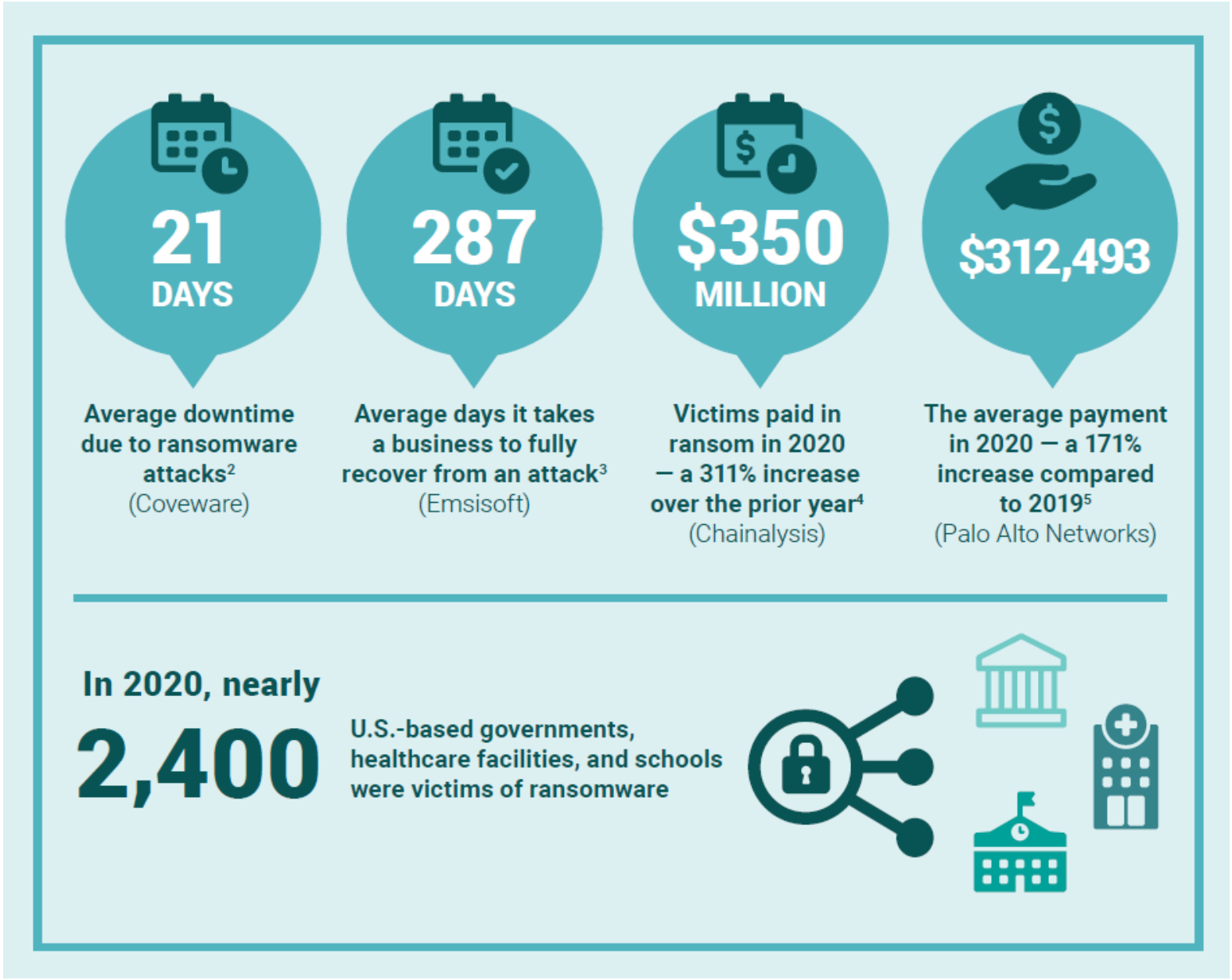
Cyber Threats

- Cyber crime is the use of Internet services or software with Internet access to defraud victims or to otherwise take advantage of them
  - Ransomware
  - Business E-mail Compromise
  - Phishing/Spoofing
  - QR Codes

Ransomware

- 39% of global data breaches caused by malware attributed to ransomware
- Malware that encrypts data or threatens to publish data unless ransom is paid
- Ransomware usually is the last step in a larger breach
  - First step is usually a credential theft process
  - Second step is to spread malware throughout network
  - Third step is to exfiltrate data/information
  - Fourth step is to encrypt systems
- Should you pay the ransom?
  - Attackers will almost always send the decryption key once they receive money
  - They still have access to the system, administrator accounts, networks
  - The only real was to ensure attackers are gone is to rebuild the systems
  - It is illegal for Government Entities in NC to pay ransomware

Ransomware


21
DAYS
Average downtime due to ransomware attacks[2]
(Coveware)
287
DAYS
Average days it takes a business to fully recover from an attack[3]
(Emsisoft)
$350
MILLION
Victims paid in ransom in 2020 — a 311% increase over the prior year[4]
(Chainalysis)
$312,493
The average payment in 2020 — a 171% increase compared to 2019[5]
(Palo Alto Networks)
In 2020, nearly
2,400
U.S.-based governments, healthcare facilities, and schools were victims of ransomware

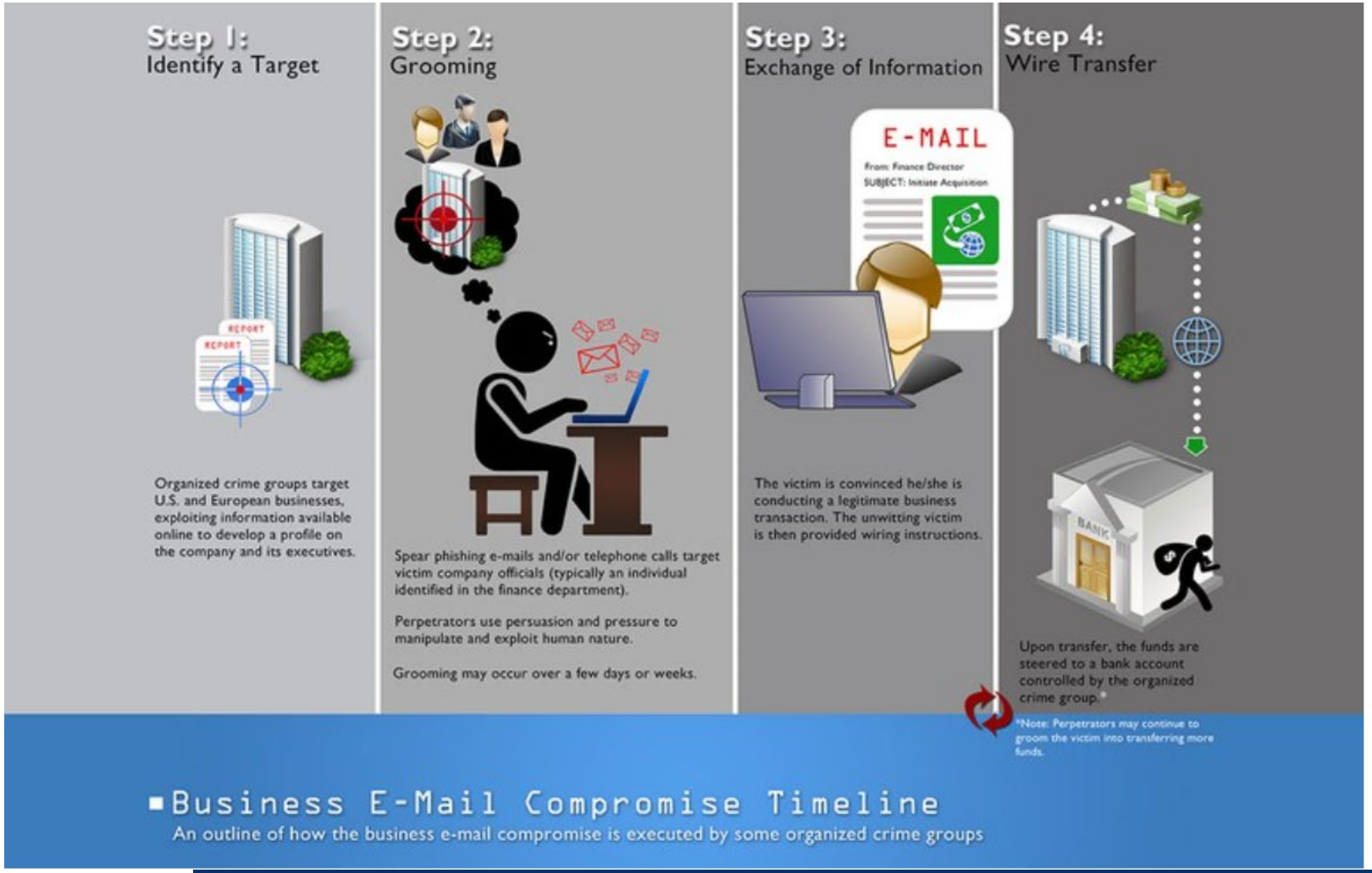
Ransomware in NC

- All attacks have had indicators of compromise in their logs weeks to months prior to attack
- Uptick in 3rd party or contractor account compromise
- Known vulnerabilities/end of life equipment
- Underfunded agencies usually the target
- House Bill 813 bans NC State Entities from paying ransomware

Business Email Compromise

- 65% increase in BEC losses from 2019-2021
- In a 5 year period, losses are estimated to be $43B worldwide
- In 2020, the FBI received 19,369 Business Email Compromise (BEC)/ Email Account Compromise (EAC) complaints
- Carried out by large criminal organizations
- Target is finances of companies
- Scam tries to get companies to perform wire transfers using existing partnerships
- Sophisticated attacks employ lawyers, social engineers, hackers
- CEO impersonator attacks

Business Email Compromise Steps



Archive file attached to email: form.zip
Password: EHGWQARLC

[redacted]

Dear Sir/Madam,

We Inform You, That we have new Announcement

'Dear All Valuable Supplier, Hereby we would like to inform you [redacted] with update June 08, 2021 revision. Please kindly take the lesson and implement it in your company's business activity. Thank you for your attention and cooperation. '
(Individual Announcement)

Expired : 31-Jul-2021

Please check the Announcement on Announcement Link.

Thanks for Your Attention
Announcement Admin
The attachment named form.zip could not be scanned for viruses because it is a password protected file.

Thread Hijacking

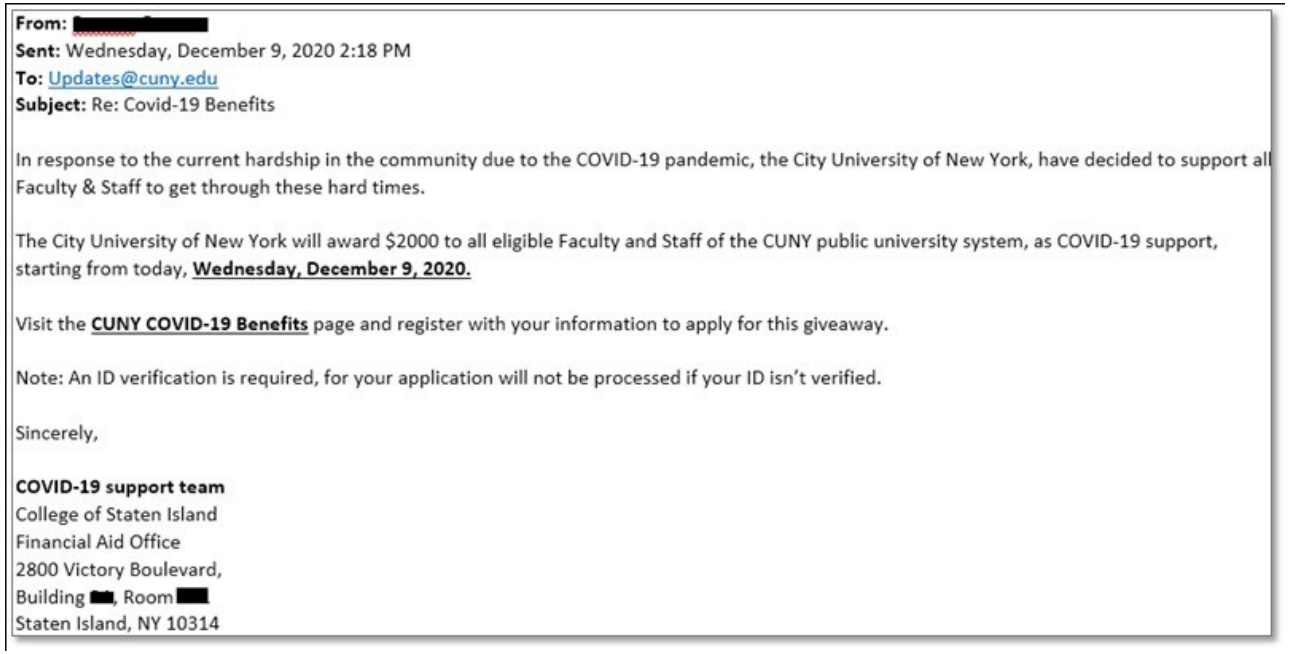
- Uses previously compromised accounts
- Reviews correspondence to find additional email addresses
- Hackers will insert malicious links or attachments into a real email thread
- Emotet is making a comeback utilizing attachments using macros in Excel
- Drops malware for credential harvesting or ransomware

Phishing/Spoofing

- Email or instant message that tries to obtain sensitive information
- Social engineering process that can appear to be from trusted sites or senders
- Multiple types
  - Spear phishing targets specific individuals
  - Whaling targets senior executives or high-profile targets
  - Clone phishing uses a previous email to make malicious identical email
  - Link manipulation changes the URL just enough to appear legitimate
  - Website forgery uses code to appear to be the correct website

COVID Scams

- 18 million COVID-19 themed phishing emails were blocked per day
- Attacks for unemployment benefits, vaccines, at-home tests, etc
- Fake emails for Zoom and other collaboration sites



From: [redacted]
Sent: Wednesday, December 9, 2020 2:18 PM
To: Updates@cuny.edu
Subject: Re: Covid-19 Benefits

In response to the current hardship in the community due to the COVID-19 pandemic, the City University of New York, have decided to support all Faculty & Staff to get through these hard times.

The City University of New York will award $2000 to all eligible Faculty and Staff of the CUNY public university system, as COVID-19 support, starting from today, **Wednesday, December 9, 2020.**

Visit the **CUNY COVID-19 Benefits** page and register with your information to apply for this giveaway.

Note: An ID verification is required, for your application will not be processed if your ID isn't verified.

Sincerely,

COVID-19 support team
College of Staten Island
Financial Aid Office
2800 Victory Boulevard,
Building [redacted], Room [redacted]
Staten Island, NY 10314

QR Codes

- Use of QR codes has skyrocketed since COVID
- Very easy to tamper with a code to redirect the link to a malicious site
- Stickers are easy to post over the correct QR code
- Do not download Apps from a QR code (only use the phone's app store)
- FBI Notice in Jan 22 outlining the risks with QR codes

PREVENTION STEPS

Prevention Steps

- Employee Training
- System patching and maintenance
- Scheduled maintenance periods
- Defense in Depth
- Security Policies
- Incident Response Plan
- Use your tools correctly

Top Issues Identified

- Patch management
- Outdated/End of Life Devices
- RDP Exposure
- Insufficient Backup Procedures
- Network Segmentation Lacking
- Shared or Improper Use of Admin Accounts
- Rogue Device Detection on Wireless
- Anonymous logons
- SMBv1 enabled
- TLS certificates expired

OPEN FORUM