

CYBER SECURITY DEEP DIVE

Presented by Paul Jones CIO, City of West Palm Beach CISSP, CISA, Security+, GLEG, ITIL Expert, Project+



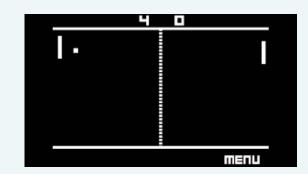
Remember When!!







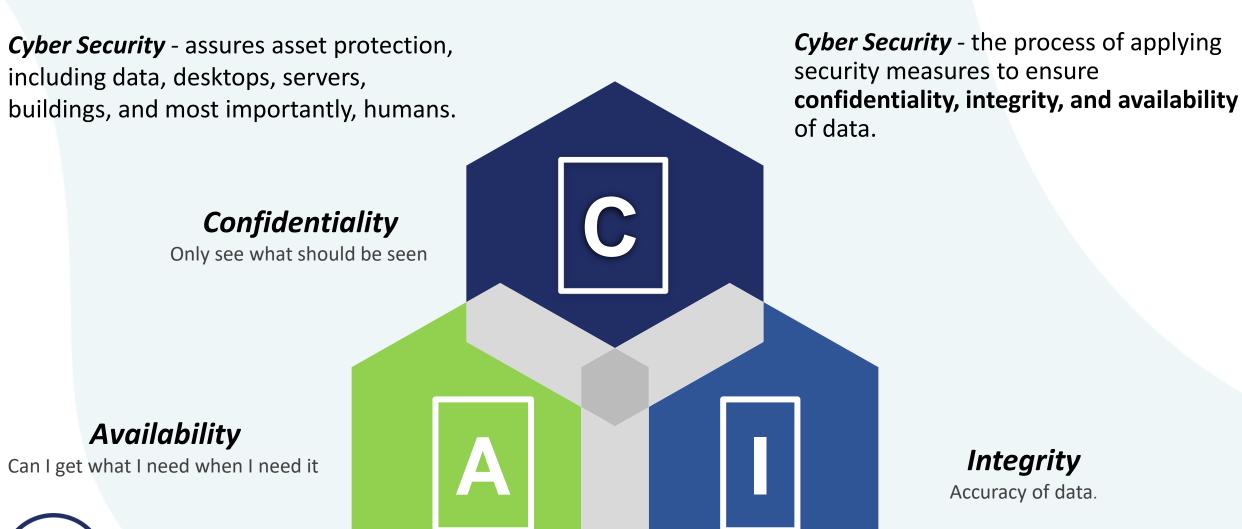








Cyber Security



#FGFOA2023

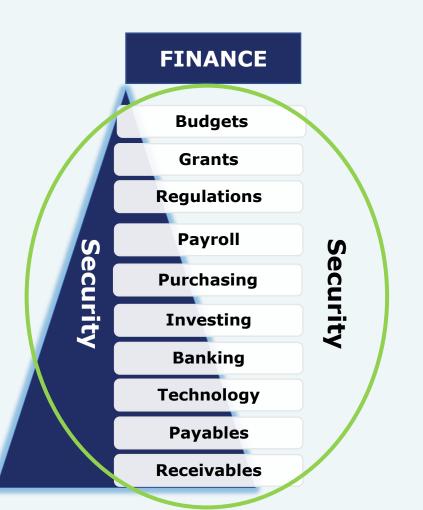
The Challenge

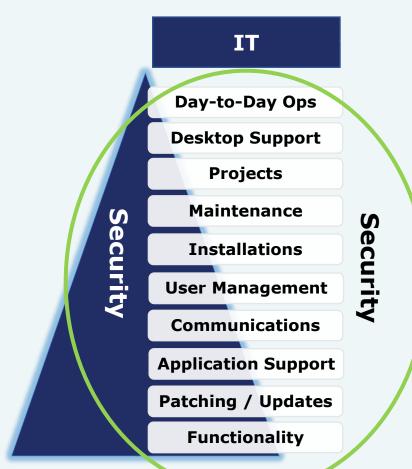






The Goal







Online Dangers

- There is a hacker attack every 39 seconds
- 300,000 new pieces of malware are created every day
- 92% of malware that businesses encounter is delivered via email
- Most breaches involve phishing and using stolen credentials
- Today's cybercriminals are motivated by the illicit profits of online crime

- More than 6,000 criminal marketplaces sell ransomware products and services
- Cybercrime is more profitable than the global illegal drug trade
- Hackers have exposed the personal information of 110 million Americans
- 27% of data breaches involved internal actors
- Costs of cybercrime are estimated to reach \$10 trillion by 2025



Question - 1

The CIA Triad Includes:

Confidentiality, Integrations, Access

B Concealment, Integrity, Accessibility

Confidentiality, Integrity, Availability

Conformity, Interfaces, Availability



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Finance a Bad Actor's Dream

Personally Identifiable Information (PII)

Credit Cards Money, Money, Money **Wire/ACH Transactions Social Security Numbers Payroll Information Banking Information Direct Payments**

Direct Deposits

Employee Information



Automatic Draws

Vendor Information

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The Target



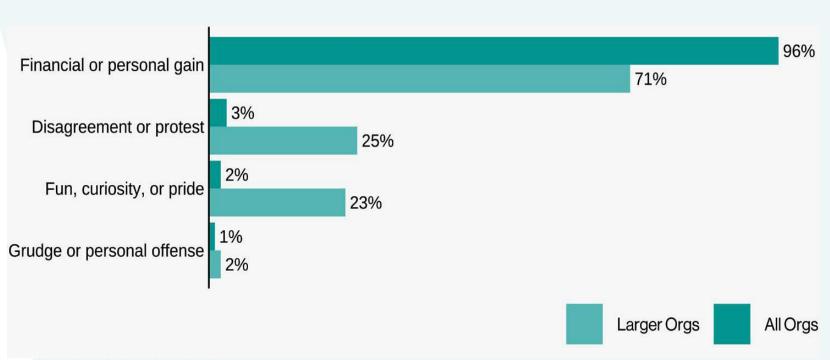
The Financial Sector continues to be victimized by financially motivated organized crime, often via actions of Social (Phishing), Hacking (Use of stolen credentials) and Malware (Ransomware). Finally, Miscellaneous Errors, often in the form of Mis-delivery, is still very common.







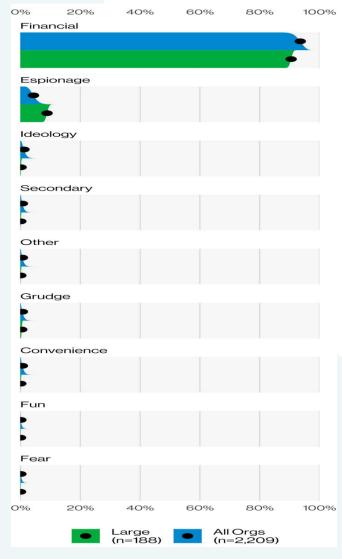
Why Would Anyone Do This



Verizon Data Breach Investigations Report for 2022



MONEY, MONEY, MONEY



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The Culprit



Organized Crime = 79%



Key Threats!!

Basic Web Application Attacks These attacks are against a Web application, and after initial compromise, they do not have a large number of additional Actions.

System Intrusion Complex attacks that leverage malware and/or hacking to achieve their objectives.

Miscellaneous Errors Incidents where unintentional actions directly compromise secure information.

Social Engineering A psychological compromise of a person that alters their behavior into taking an action or breaching confidentiality.



Privilege Misuse Incidents driven by unapproved or malicious use of legitimate privileges.

Denial of Service Attacks Compromise the availability of networks and systems.

Lost and Stolen Assets Incidents where an information asset went missing, whether through misplacement or malice.

Everything Else This "pattern" isn't a pattern at all. Instead, it covers all incidents that don't fit within the orderly confines of the other patterns.



Key Finance Threats!!

Basic Web Application Attacks - These attacks are against a Web application, and after initial compromise, they do not have a large number of additional Actions.

System Intrusion - Complex attacks that leverage malware and/or hacking to achieve their objectives.

Miscellaneous Errors - Incidents where unintentional actions directly compromise secure information.

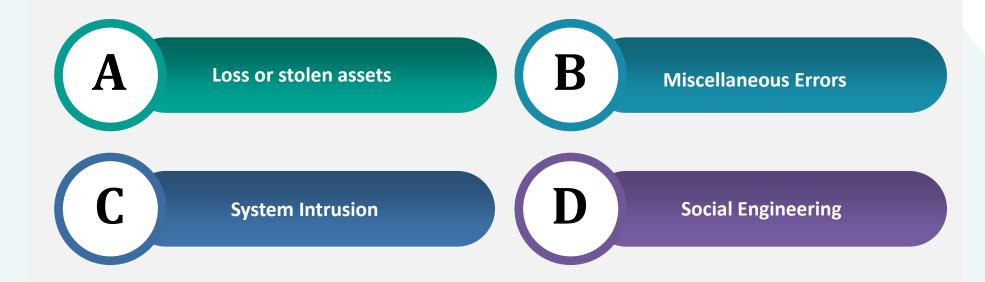
Social Engineering - A psychological compromise of a person that alters their behavior into taking an action or breaching confidentiality.





2nd Question?

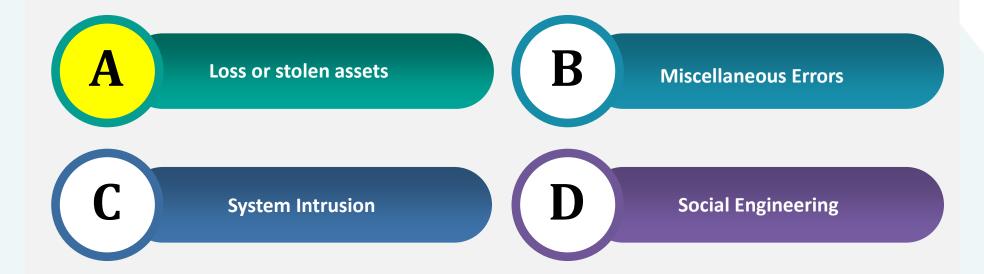
According to the 2022 Verizon Breach Investigation Report, which is not one of the top key finance threat vectors?





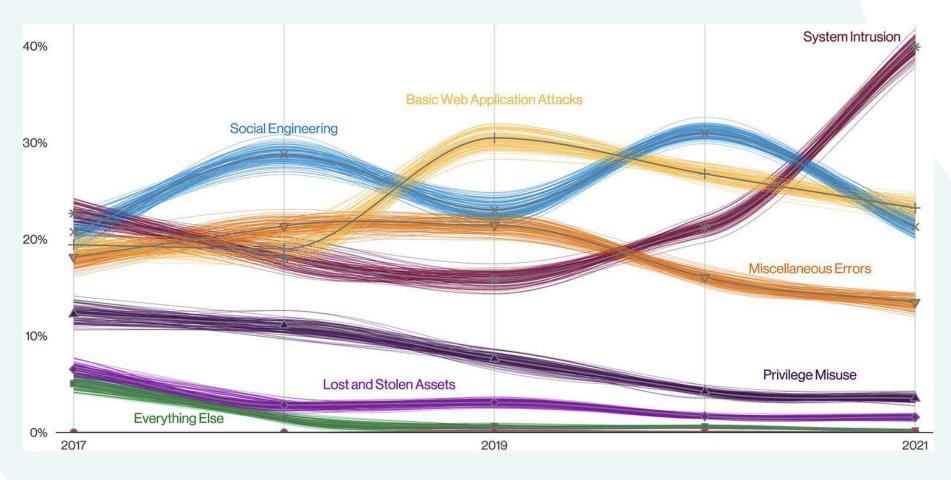
2nd Question?

According to the 2022 Verizon Breach Investigation Report, which is not one of the top key finance threat vectors?





The Numbers





Breach Statistics

According to <u>The Identity Theft Research Center (ITRC) Annual Data</u>

<u>Breach Report,</u> 2022 had the second-highest number of data compromises in the U.S. in a single year. At least 422 million individuals were impacted.

According to the FBI's <u>Internet Crime Report 2022</u>, 800,944 complaints of cybercrime were reported to the FBI by the public, a 5 percent decrease from 2021. However, the potential total loss increased to \$10.2 billion in 2022, up from \$6.9 billion in 2021. California, Florida, and Texas had the highest number of cybercrime victims.

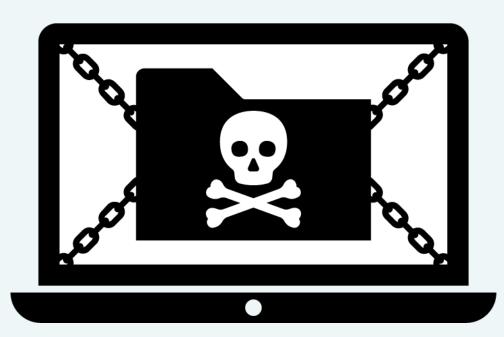


Let's Talk Ransomware

There are four main categories of ransomware:

- **1. Encryption** Encrypts data and makes it impossible to unlock without a decryption key.
- 2. Lockers Restricts the use of your computer, making it impossible to work or use basic functions until the ransom is paid.
- **3. Scareware** Attempts to scare users into buying unnecessary software.
- 4. Doxware/Leakware Threatens to leak personal or company data unless the ransom is paid.

\$456.8 million extorted in 2022



Basic Protection

- Backup Data and Verify Restores
- Keep Backups Isolated
- Keep All Systems and Software Updated
- Install Antivirus Software and Firewalls
- Network Segmentation
- Email Protection
- Application Whitelisting
- Endpoint Security
- Limit User Access Privileges
- Run Regular Security Testing
- Security Awareness Training





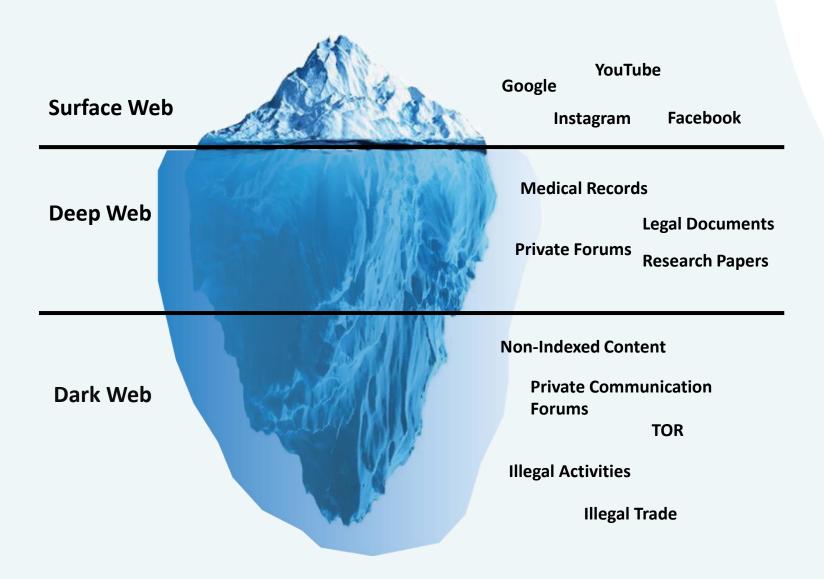
Florida amended its State Cybersecurity Act to prohibit state agencies, counties, and municipalities experiencing a ransomware attack from paying or otherwise complying with a ransom demand.

The Market Place





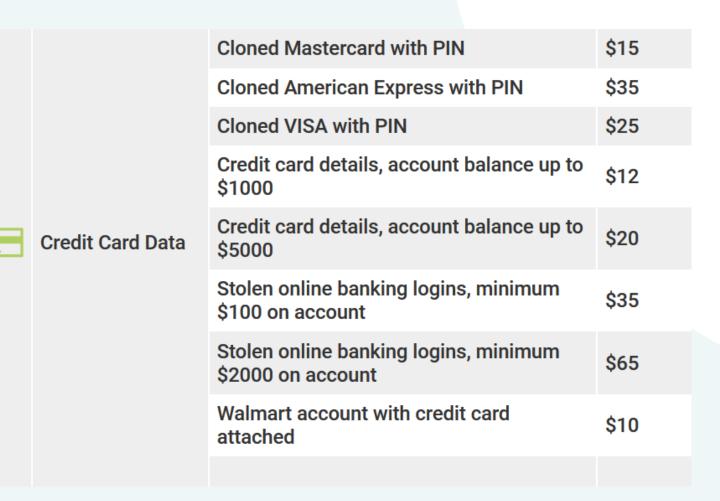
The Web





Shady Shopping

Type of account	Average price log-in goes for on dark web
PayPal	\$247
Costco	\$5
ASOS (clothing)	\$2
Airbnb	\$8
Uber	\$7
T-Mobile	\$10.51
DHL	\$10.40
Facebook	\$5.20
Gmail	\$1
Grubhub	\$9 screenshot via MarketWatch.co





Shady Shopping

Product	Price	Quantity
Remote control the phone of someone else, most new models supported	700 USD = 0.01286 \$	1 X Buy now
Facebook and Twitter account hacking	500 USD = 0.00919 \$	1 X Buy now
Other social network account hacks, for example reddit or instagram	450 USD = 0.00827 \$	1 X Buy now
Full package deal, getting access to personal or company devices and accounts and searching for the data you need.	1800 USD = 0.03308 \$	1 X Buy now
DDOS for protected websites for 1 month	900 USD = 0.01654 B	1 X Buy now
DDOS for unprotected websites for 1 month	400 USD = 0.00735 \$	1 X Buy now
Hacking webservers, game servers or other internet infrastructure	1300 USD = 0.02389 B	1 X



Shady Shopping





The One Stop Shady Shop

Carder's Parad	ise	≡						SUPPORT BILLING	_
NEWS		High Score	SSN with 0	Credit Report					
CREDIT CARDS	<	SCORE	SEX	DOB	ZIP	STATE	CITY	PRICE	
SSN	<	850	М	11/23/1957	55428	MN	NEW HOPE	\$150	Buy
SIN	<	849	F	10-08-1956	31216	GA	MACON	\$145	Buy
SSN W/ REPORT	~	847	F	04-09-1957	31210	GA	MACON	\$145	Buy
HIGH SCORE		842	F	06-05-1957	31210	GA	MACON	\$145	Buy
MEDIUM SCORE ORDERS		842	М	08-16-1956	31211	GA	MACON	\$145	Buy
CREDIT REPORTS		840	F	06-23-1956	31220	GA	MACON	\$145	Buy
ACCOUNTS	<	840	F	11/21/1969	55337	MN	BURNSVILLE	\$135	Buy
BIN BASE		827	М	4/13/1959	55446-2117	MN	PLYMOUTH	\$125	Buy
		825	F	04-03-1957	31204	GA	MACON	\$120	Buy
LOGOUT		824	М	03-02-1956	31204	GA	MACON	\$120	Buy



Risk Mitigation

Organizational security is all about defining and mitigating risks.





If we have limited time and resources, where and how we focus our efforts is the key.

Know Your Risks

Risk Register

#	Threat /Risk	City Impact?	Currently Mitigated?	Risk Factor	Suggested Priority	Notes
1	Account Takeover					
2	Advanced Persistent Threat					
3	Application Access Token					
4	Bill Fraud					
5	Business Invoice Fraud					
6	Brute Force Attack					
7	Compromised Credentials					
8	Credential Dumping					
9	Credential Reuse Attack					
10	Credential Stuffing					
11	Cloud Access Management					
12	Cloud Cryptomining					
13	Command and Control					
14	Cross-Site Scripting					
15	Cryptojacking Attack					
16	Data From Information Repositories					
17	DoS Attack					
18	DDoS Attack					
19	Disabling Security Tools					
20	DNS Amplification					



A Comprehensive Program

Technical Tier The Three Tiers Administrative Tier

Technical

- Infrastructure
- Technology Based Defense
- Prevention Technology
- Monitoring Technology
- < Access Controls

Administrative

- < Strategy
- Policies, Procedures
- < Standards
- Planning
- Responsibilities



Compliance

v Due Diligence

< Documentation

< Accountability

< Governance

Due Care

Reporting

< Audits

Security Controls

Security Culture & Awareness Data Identification & Management Risk Management Security Monitoring Patch Management Policies & Procedures Q-Wireless (WIFI) Management **Compliance Management T**-**Mobil Device Management Governance & Oversite User Access Management Intrusion Detection/Prevention Vulnerability Management Infrastructure Management Access Control Backup and Recovery Change Management Cloud Computing Incident Response Application Security Remote Access Authentication**

Mistake Management Vendor Management

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Bad Odds

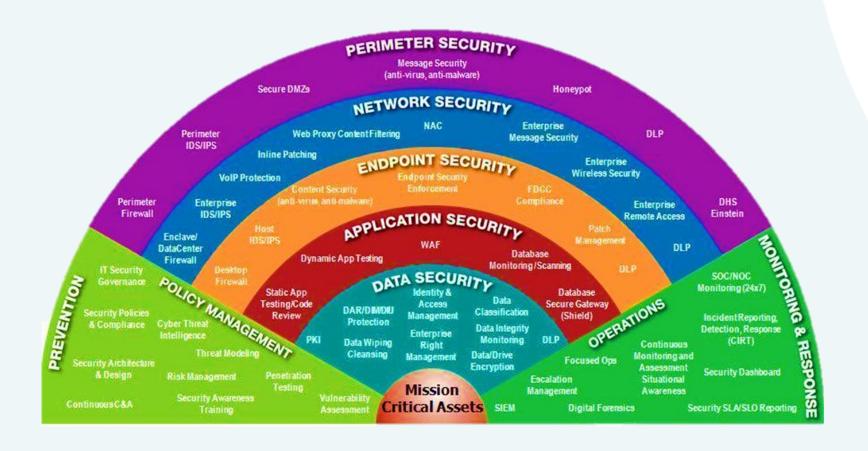
Security Culture & Awareness Data Identification & Management Risk Management Security Monitoring Policies & Procedures Patch Management Compliance Management Wireless (WIFI) Management **Governance & Oversite** Find **Mobil Device Management** Block Hundreds of Vulnerabilities One Hole **User Access Management Access Control Intrusion Detection/Prevention Vulnerability Management Infrastructure Management Change Management Cloud Computing Application Security Incident Response Remote Access** Authentication

Vendor Management

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Mistake Management

Defense in Depth





Knowbe4 - https://blog.knowbe4.com/great-defense-in-depth-infographic

IT Finance Audit

Physical and Environmental Security

 Controls to ensure that physical access to facilities where IT equipment is kept is secure and restricted to authorized personnel

Logical Security - Granting, revising, and terminating logical access of personnel to network, financial applications, and related data

- Controls to ensure access is terminated as necessary on a timely basis
- Controls to ensure that only authorized personnel are granted access; access rights
 prevent assignment of incompatible duties, and privileges are revised as needed
- Controls to ensure Individuals with full administrative access to the network and financial applications do not have access to post transactions in financial applications
- Controls to ensure unique IDs and passwords are used to access network and financial applications

IT Finance Audit

Logical Security - Granting, revising, and terminating logical access of personnel to network, financial applications, and related data

Controls to ensure that only authorized personnel are granted access; access rights
prevent assignment of incompatible duties, and access is revised as needed

Data Backup and Recovery

Controls to ensure that data is adequately backed up

Data Files, Business Rules, and Accounts

- Controls to ensure data or master files relevant to the audit are held and maintained securely
- Controls to ensure changes to data or master files are authorized, tested when applicable, reviewed, and documented



Reducing Liability

- **Due Diligence** is the act of continually investigating and understanding the risks and vulnerabilities the organization faces.
- Due Care is implementing security policies, procedures, standards, and countermeasures to protect from those threats.
- "If an organization does not practice due care and due diligence about the security of its assets, it can be legally charged with negligence and held accountable for any ramifications of that negligence" (Harris, 2010, p. 110)

CYA Cover Your Assets



Need to Know

Risk Management

- Know and document your risks
- Look at the Finance big picture

Governance

- Be part of the organization's governance team
- Create your own Security Governance Finance team

Change Management

- Develop an internal change process
- Know how IT manages changes

Application Security

 Know what apps are in use, and what interfaces and data are generated

Data Management

- Classify sensitive data
- Know where this data is stored, how it is stored, and access levels

Access / Permissions

- Know the permission levels for applications
- Ensure proper permissions are granted

Mistake Management

- Understand where mistakes are likely to happen
- Implement polices and procedures

Incident Response

- Know what to do in case of an incident
- Train staff on incident reporting and handling

Vendor Management

- Document vendors, services, data, and security concerns
- Be on the lookout for social engineering

Remote Access

- Know remote access requirement
- Know what vendors can access
- Know what remote workers can access



Need to Know





Policies and Procedures

Document security-based policies and procedures



Compliance

Document compliance measures and compliance evidence



Security Awareness

Continual security awareness training

Question - 3

Which is not a best practice for managing data?

Control Access Permissions

B Identify and Classify Sensitive Data

Know where and how data is stored

Multiple users sharing a single account



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Information Protection





Not My House

Protection

- Locked Doors
- Deadbolts
- Strong Doors
- Locked Windows
- Shatterproof Windows
- No Hidden Keys
- Few Keys Limited Distribution
- Security Cameras
- Security Alarm System
- Intrusion Detection
- Steal a Key
- Gated Community
- Security Guards





Easy Access Entry

- Unlocked Doors
- Unlocked or Open Windows
- Hidden Keys
- Accessible Chimney
- Try to Steal a Key
- Follow You In

Forced Entry

- Tool Kit
- Bypass Security Systems
- Pick Locks
- Bust Through the Door
- Break a
- Use Glass Cutter
- Force Through Any Opening
- Staying Out of Site

Not My Data

Protection

- Security Awareness Training
- Access Controls
- Continual Vulnerability Testing
- Continual Patching
- Intrusion Detection
- Intrusion Prevention
- System Monitoring and Alerts
- Policies and Procedures
- Issue Reporting and Management
- Continual Due Diligence
- Continual Due Care



Easy Access Entry

- Footprinting
- Discovering Known Vulnerabilities
- Discovering Holes in the System
- Stealing Credentials
- Buying Credentials
- Tricking via Social Engineering
- Phishing

Forced Entry

- Tool Kits
- Bypass Security Controls
- Exploit a Vulnerability
- Exploit an Application Weakness
- Exploit Unpatched Systems
- Brute Force



Crimes



Can Include:

- Stolen Money
- Fraud
- Productivity Losses
- Theft of Personal Data
- Embezzlement
- Post-attack Disruption
- Hacked Data and Systems
- Ransomware
- Destruction or Damage to Data
- Theft of Intellectual Property
- Financial Data Breaches



Creating A Culture of Security Awareness



Information/Cyber Security is Everyone's Responsibility

What You Don't Know Will Hurt You



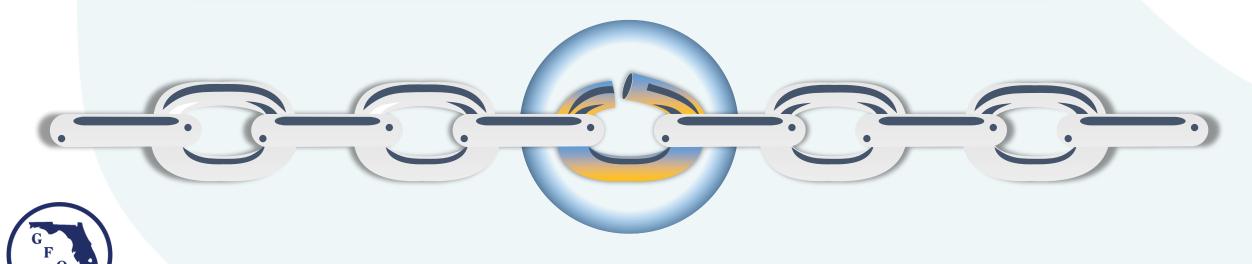
Lack of Knowledge The Weakest Link

The Human Element

Humans are the weakest link in the security chain.

- Social engineering scams
- Phishing scams
- Human errors

- Human naivety
- Disgruntled employees
- Mistakes



No Easy Target

Security awareness is the knowledge and attitude that members of an organization possess regarding the protection of the physical, and especially informational, assets of that organization.









Lock the Car Doors

4th Question?

Who is responsible for cybersecurity in an organization?

A Organization Leaders

Risk Management

C Information Technology (IT) Everybody



4th Question?

Who is responsible for cybersecurity in an organization?

A Organization Leaders

Risk Management

C Information Technology (IT)

Everybody



Pop the Bubble of Trust

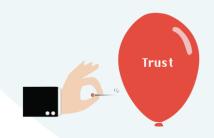
DANGER



ZERO TRUST ZONE

DANGER







The Bad Actor's Best Friends



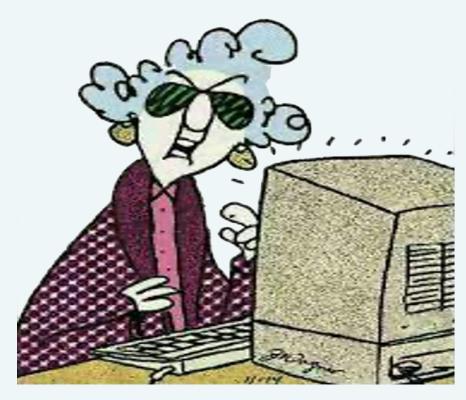
The Keys to the Kingdom

Handle your passwords with kids gloves and:

- Always change your password as required
- Always use complex passwords
- Never share your password
- Never write your password down
- Never use the same password for everything
- Use Dual Factor Authentication



Password Headache



I forgot the password for the file where I keep all my passwords.



A Numbers Game

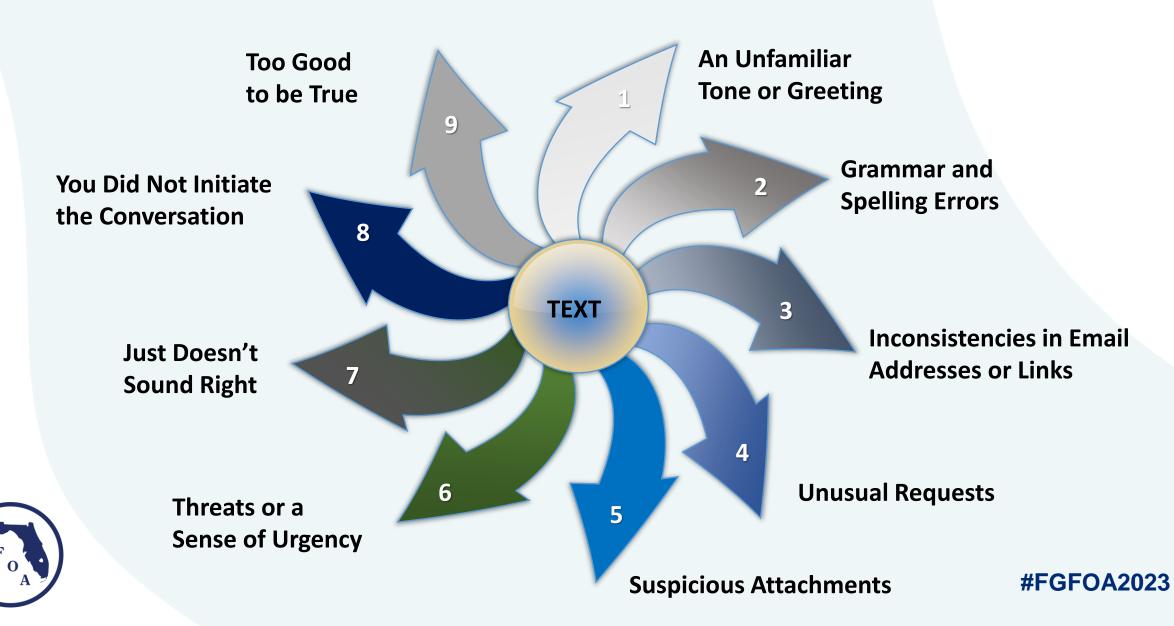
By blasting one phishing email, it is almost certain that someone will take the bait and:

- Open an infected attachment
- Click on an infected link
- Buy something that doesn't exist
- Give out confidential information
- Be gullible





Phishing Email Red Flags



Phishing Examples – Mouse Hover

Security Alert!!!

Dear mwhite@wpb.org,

Our spide http://bofa.com-onlinebanking.com/ ox today.

If left unclxywnf0aw9upwmnsawnrjndvybd1oaodhr itdown or loss of important da wqczovl3nlty3nvyzwqtbq9naw4ubmv0ql

3bhz2vzlzuwmjuxmzy3zmmxzwimcmvjax

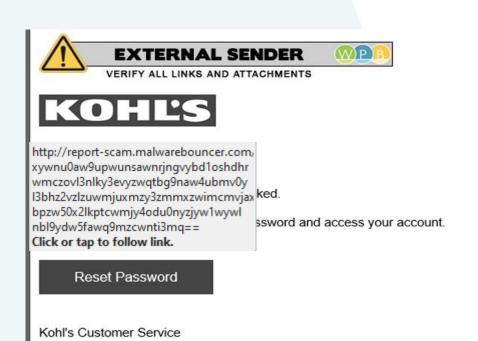
To protectbpzw50x2lkptywmzuzmtg4nszjyw1wywl /nbl9ydw5fawq9mzaznze0na==

Click or tap to follow link.

Avast Quick Scan

*Note: This will serve as a final notification to this threat.

Source: Avast Internet Security





Examples: Urgent / Unusual Request

Sender email address is from your

organization, but may not be real.

From: CEO <CEOpresident@wpb.org>

Reply-To: CEO <CEOpresident@wpb.org>

Subject: Re: Hello Michael

Subject line shows a "reply" to something you never sent or requested.

Michael,

Unusual request & Sense of urgency.

I need you to do me a favor urgently. I need you to get me a few iTunes gift cards from the Apple store. Please get six iTunes gift cards worth \$100 and have them sent to me here via email. Let me know if you can do that right away?

Thanks.



Examples: Too Good to be True

From: Coca Cola Foundation <olympicprizewinners@cocacolafoundatio←

Email is spoofing a well-known organization.

n.com>

Reply-To: Coca Cola Foundation <noreply@cocacolafoundation.com>

Subject: You've won a cash prize from the Coca-Cola Foundation!

Too good to be true.

Congratulations Michael!

You've just won a cash prize of \$5,000 from the Coca-Cola Foundation in partnership with the International Olympic Committee (IOC).

Your email address was chosen from a random drawing last Monday. To claim your prize, visit our winner's website to confirm your address as well as choose a payment option for your prize.

Prompts you to complete a request to gain something of value.

WINNER'S WEBSITE



Please do not reply to this email as the email address is unmonitored.

From: IT Department < it-department@wpb.org>

Sent: Monday, November 21, 2022 10:27 AM

Not an email we use

To: Amado Yamasaki <a y amasaki @wpb.org>
Subject: Social Media Activity Reports



Everyone,

We have recently noticed a high volume of social media posts containing inappropriate content. It is our goal to maintain a level of professionalism with our members and within our culture. The social media presence and image of or organization important, and as an extension of our organization, certain caution and care must go into what is posted on social media.

Please review your individualized social media report, and explain its content. Note that reports were created for all users and may not contain inappropriate material. Also, note that any flagged content created by social media friends of which you are tagged in will also be present in these reports. Review by the **end of the day**.

To begin your review, access your report and authenticate with your network username and password using the link below:

Asking you to verify credentials

Social Media Content Reports

Thanks,

Dave Papadopoulos

Director - Information Technology



Not the Director – We don't have a Director, we have a CIO

WEST PALM BEACH

Information Technology

Privileged or confidential information may be contained in this message. If you are not the addressee indicated in this message (or responsible for delivery of the message to such person), you may not copy or deliver this message to anyone. In succase, you should destroy this message and kindly notify the sender by reply e-mail. Please advise immediately if you or your employer do not consent to Internet e-mail for messages of this kind. Opinions, conclusions and other information in this message that do not relate to the official business of my company shall be understood as neither given nor endorsed by it.

Question - 5

Which of the following is not a Phishing Email Red Flag?

Email is from someone you know

B

Email creates a sense of urgency

There are suspicious attachments

D

Inconsistencies in email addresses or links



Question - 5

Which of the following is not a Phishing Email Red Flag?

Email is from someone you know

B

Email creates a sense of urgency

There are suspicious attachments

D

Inconsistencies in email addresses or links



Social Engineering



"You could spend a fortune purchasing technology and services...and your network infrastructure could remain vulnerable to old-fashioned manipulation."



-Kevin Mitnick

It Sounded So Real

They sounded so legitimate

"Hello John, this is Bill from IT (Microsoft), and I am updating your computer right now, but I need your password to install these new much-improved applications for you. You are going to love these new features!!!"



No legitimate business or person will ever ask you for your password, credentials, or PII via text, email, or phone.



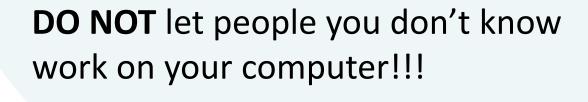


Verify and Validate

USB Devices - If you are not positive where something came from, **DO NOT** connect it to your computer!!!











Social Engineering Attacks

- **Pretexting** Creating a fake scenario
- Phishing Sending out bait to fool victims into giving away their information
- Fake Websites Modeled to look like the real thing so that a login with real credentials are now compromised
- Fake Pop-up Pops up in front of the real website to obtain user credentials
- Artificial Intelligence Used to predict behaviors and focus individualized attacks
- Deepfakes Fake audio and video that makes a person appear to be saying something they did not say



Incident Reporting

Immediately report any suspected concern to your supervisor/manager/director or directly to the IT Help Desk



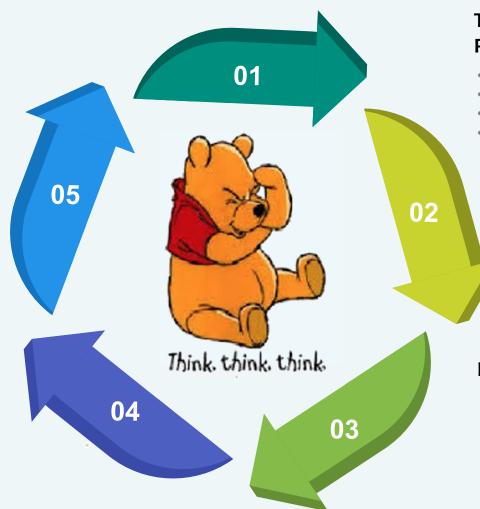
Security Awareness Basics

Pop the Bubble of Trust

- No trusting allowed
- · Verify, verify, and then verify again
- If it sounds too good to be true, then it is

See Something Say Something

 Immediately report any suspicious activity to your supervisor, manger, director or directly to the help desk



Take Password Protection Seriously

- Use complex passwords
- Don't write them down
- Change them frequently
- Don't share them

Never Give Out Personal Info

 No legitimate organization will ever ask you for personal information via email or phone

No Phishing Allowed

- · Don't take the bait.
- Think twice before you click



Security Awareness Training Options

- Provide continual security awareness training and make it required
- Create security newsletters
- Perform continual social engineering and phishing tests
- Establish a departmental security team
- Establish peer groups
- Create a departmental security liaison
- Create a "See it Say it" incident reporting program
- Add security updates and discussions to the departmental meeting agenda
- Reward and recognize good security actions and behaviors



It Happens Every Day

January 2023

Total: 25 entries

Affected industries: 20

Public sector: 8

Finance: 2

February 2023

Total: 34 entries

Affected industries: 23

Public sector: 11

Finance: 3

March 2023

Total: 38 entries

Affected industries: 24

Public sector: 10

Finance: 3

April 2023

Total: 17 entries

Affected industries: 16

Public sector: 7

Finance: 1





The Wheels of Misfortune





The Must-Haves

- Establish strong senior leadership buy-in (make security important)
- Adequate FUNDING
- Develop robust governance and oversite (what you permit, you promote)
- Work with IT to validate and verify expectations
- Incorporate security in everything you do
- Know your data and identify sensitive data
- Know where and how sensitive data is stored
- Know who has access to your data and what permissions they have

- Don't take for granted everyone is doing what is needed
- Keep security "top of mind" for everyone
- Know your vendors and financial partners,
 and identify system access and data transfers
- Identify where mistakes can happen and mitigate risks
- Stay current with cyber security regulations
- Create departmental security policies and procedures, or add security sections to current policies and procedures
- Define compliance expectations
- Pop the "Bubble of Trust"
- Make security part of your culture

Question - 6

Which of the following is not a security program "must have?"

A Strong leadership buy-in

Relying on IT to have everything taken care of

Staying current with cyber security regulations

D

Security Awareness Training and popping the "Bubble of Trust"



Question - 6

Which of the following is not a security program "must have?"

A Strong leadership buy-in

Relying on IT to have everything taken care of

Staying current with cybersecurity regulations

Security Awareness Training and popping the "Bubble of Trust"





Questions?



Thank You

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