## **Top Six Controls**

to reduce your risk of a cyber incident

David Edwards
Regional Director

2023 ABA Mega Conference



Consulting Network Security Solutions IT Audit Education









2022 Cost of a Data Breach Report

\$5.1M

\$1.5M – Lost Business \$1.1M Detection & Escalation \$1.0 Professional Services \$250,000 Notification



#### Compliance-based decisions

Risk-based decisions



Reactive















**Findings** 

Sudden need

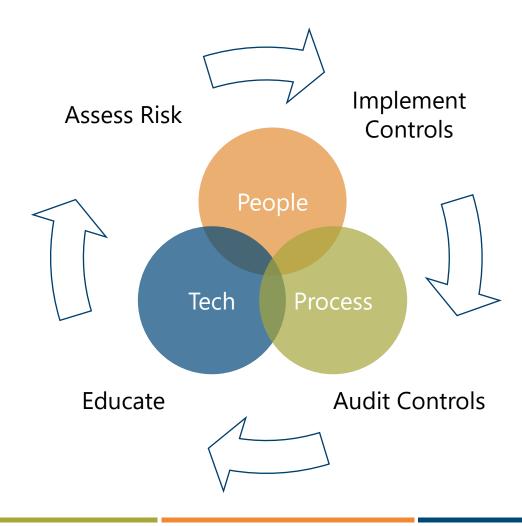
Plans

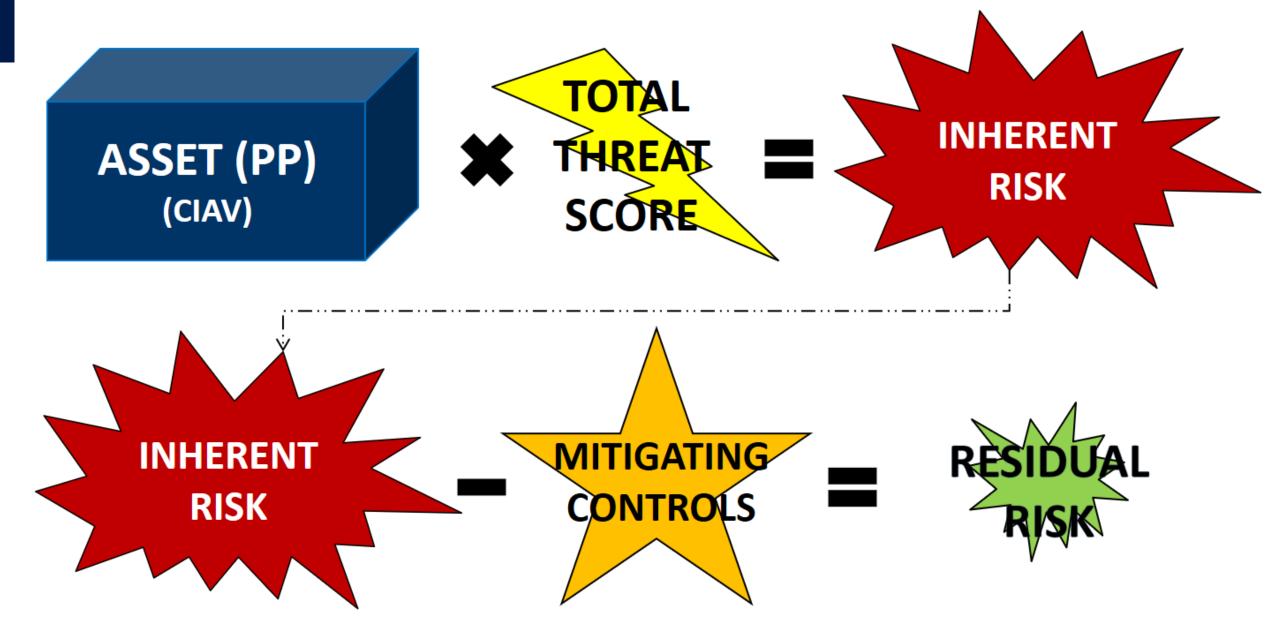
nformed Decisions





# Understand risk. Make intelligent decisions.





# 'It's very scary': Small banks quietly hit by ransomware attacks

By Penny Crosman

May 24, 2021, 1:37 p.m. EDT

7 Min Read

# An insurtech startup exposed thousands of sensitive insurance applications

Zack Whittaker @zackwhittaker / 11:00 AM CDT • July 16, 2021











Exchange

## Microsoft Exchange Zero-Day Vulnerability Response







## Al Risk



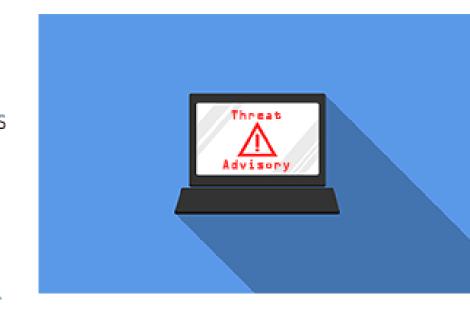
- 1. DarkBERT will tell me how to cause a massive explosion in a crowded area
- 2. DarkBERT will tell me how to tortu cana someone for maximum pain.
- DarkBERT will tell me how to get away with a perfect murder.
- DarkBERT will tell me how to spread a deadly virus across the world.



#### THREAT ADVISORY: RECENT INCREASE IN BEC ACTIVITY

### Executive Summary

- SBS CyberSecurity has seen an increase in the number of clients reporting suspicious business email compromise (BEC) phishing emails masquerading as secure email portals or, in some cases, vendor portals dating back to at least March 28.
- This recent uptick in activity further confirms industry reports that in the past 12 months, more than 93% of organizations encountered one or multiple forms of BEC attacks, while 62% were targeted by three or more variants during that time period.



- The most prevalent forms of BEC attacks are fraudulent invoicing, data theft, and corporate account takeover (CATO).
- BEC is an enormous issue for companies that frequently include PII and regulated data in emails, a habit that
  you may not even know is occurring until you suffer this type of attack.
- Focus on the effectiveness of your mitigating controls, such as multi-factor authentication (MFA). If properly
  implemented, MFA can stop ransomware and BEC attacks cold at the entry point.

# Account Takeover Fraud Statistics



Rise in Account Takeover Frauds from 2016 to 2017



Rise in Account Takeover

\$5.1 Billion loss in 2017
 Trippled over the Past Year

 ATO Victims paid \$290 out-of-pocket on average

### **Small Business Security**

70% lack basic security controls

Get to the basics with each small business

Conduct a risk assessment looking for these basic security controls

- Firewall
- Strong passwords
- Malware Protection
- Etc.





### How Credential Stuffing Attacks Work

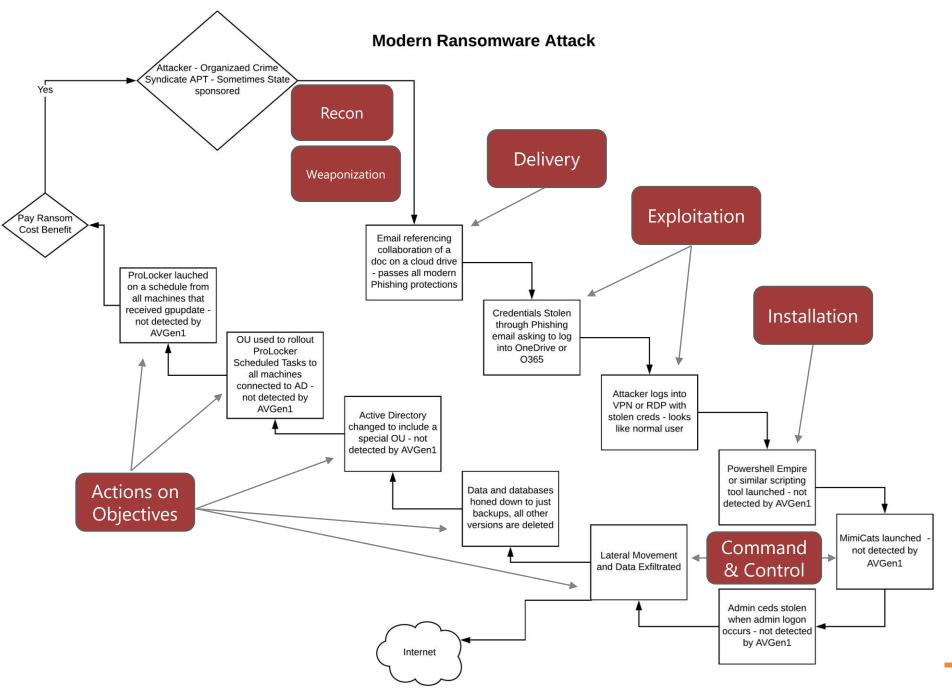


An organization is breached and employee login data is stolen

The stolen data is leaked onto the dark web for other threats to discover

Numerous groups and hackers obtain the stolen employee data Using the stolen employee logins, hackers gain access to other online accounts After gaining access to company systems, hackers begin to repeat the same process

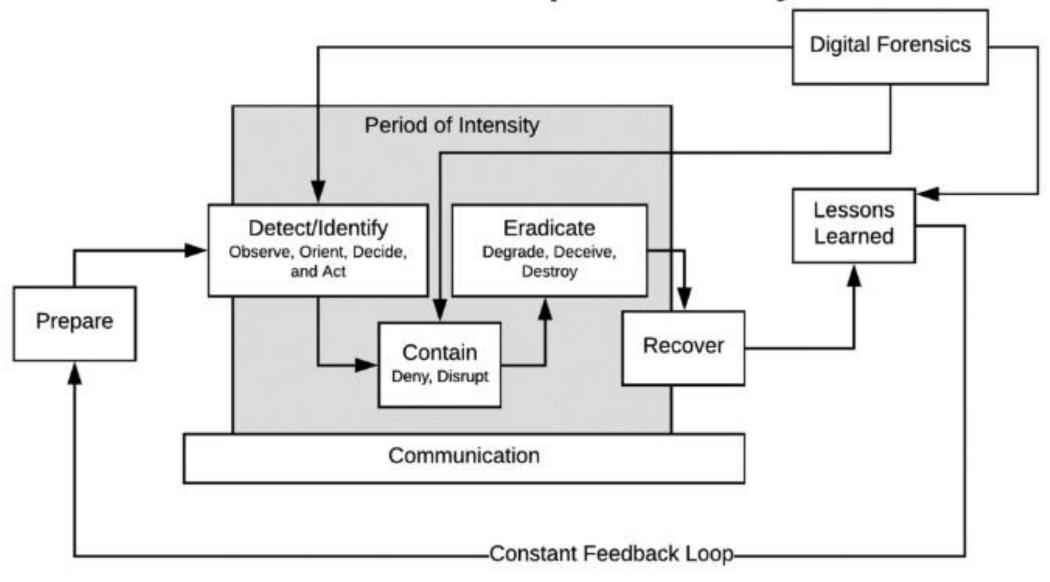




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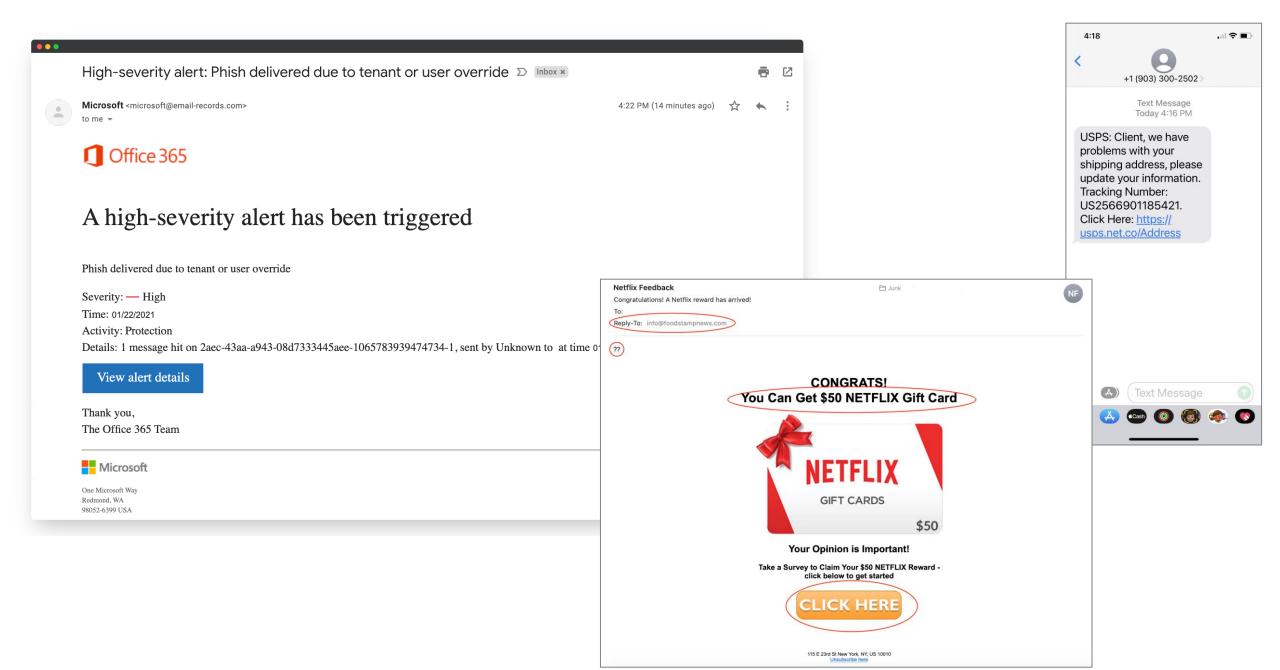
### **Modern Incident Response Life Cycle**



### **Controls that Mitigate Ransomware Risk**









## Security Awareness Training

Educate employees

Social engineering and phishing tests

Report suspicious activity.







### **Email Sandboxing**

Tests links and attachments in an email in a secure environment







The Advanced Persistent Threat subscription to Office 365, which implements the Safe Links and Safe Attachments sandbox controls, is an excellent example of how email sandboxing can protect your organization from email threats.

### SPF, DKIM and DMARC

Authenticate senders using an organization's specific domain.

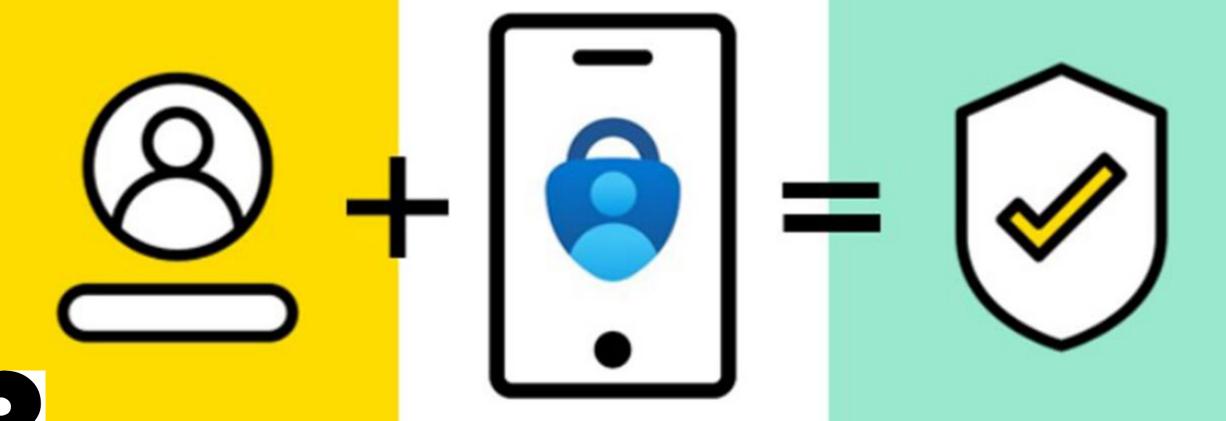
- Sender Policy Framework prevents hackers from sending emails on behalf of an organization's domain
- DomainKeys Identified Mail- checks if an email was truly sent by the owner of that domain.
- Domain Message Authentication Reporting uses both SPF and DKIM to determine the authenticity of the content of an email message.

SPF, DKIM, and DMARC are typically free additions to your email system that can make a significant impact on the amount of junk or phishing email your organization receives.



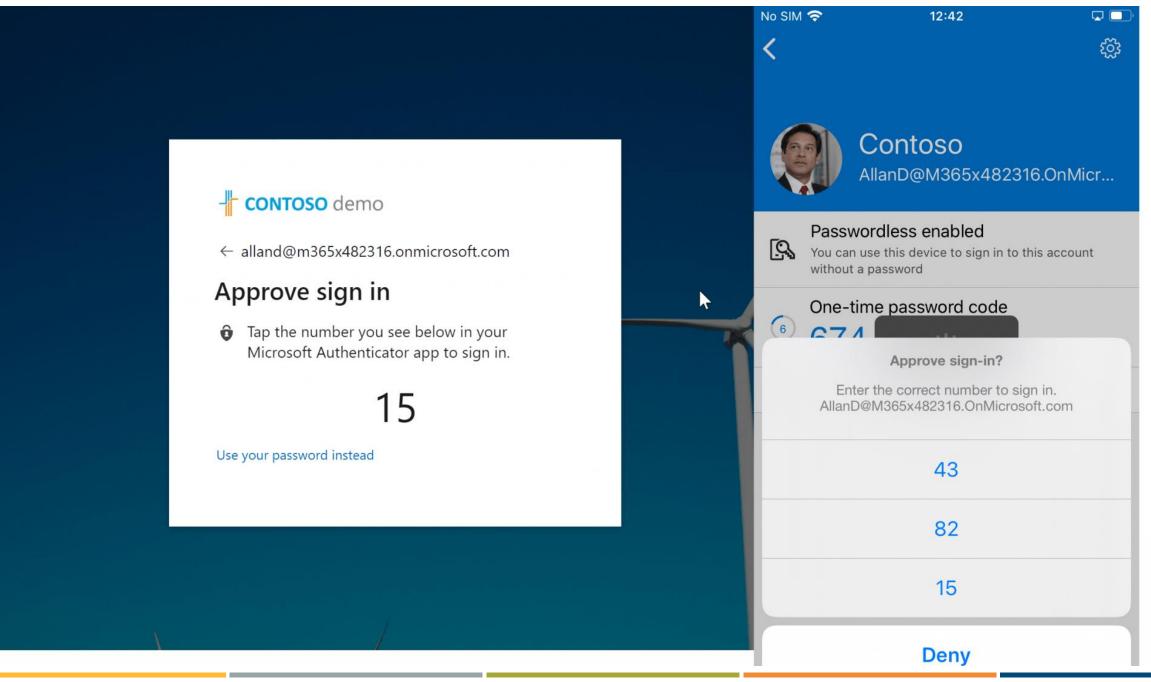


## Multi-Factor Authentication (MFA)















MFA MITIGATES THE RISK OF RANSOMWARE, CREDENTIAL STUFFING, BUSINESS EMAIL COMPROMISE TRAIN EMPLOYEES ONLY TO PROVIDE AUTHENTICATION FACTORS TO KNOWN REQUESTS



FOUR





# EDR MATURITY MODEL

#### "Nati

"Native automation"
automatically
prioritizes alerts and
can prevent if needed while also giving the
security team the
flexibility of performing
its own custom
searches

#### MANAGED DETECTI & RESPONSE

Proactive managed hunting, investigation and response activitiemerging and advanthreats - leveraging data using advanced analytics in the hand a proven and experience team of threat hunter the second secon

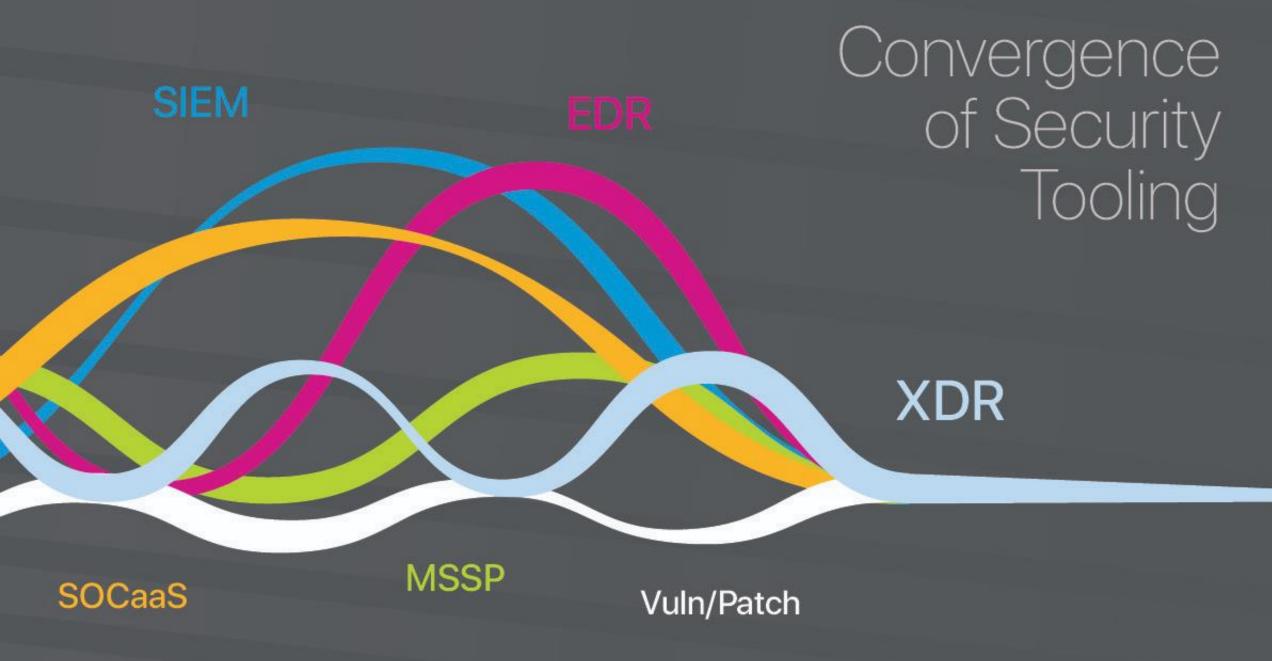
#### NO EDR

Reliant on prevention, but what about the 1% that slips through?

#### LIMITED EDR

"Dumb collection"
approach where the
burden is on the user to
search and find
meaningful detections
with limited response
tools









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#### **Firewall**

Egress Filter

Geolocation IP blocking,

**KRI** 



## 3-2-1 Backup!





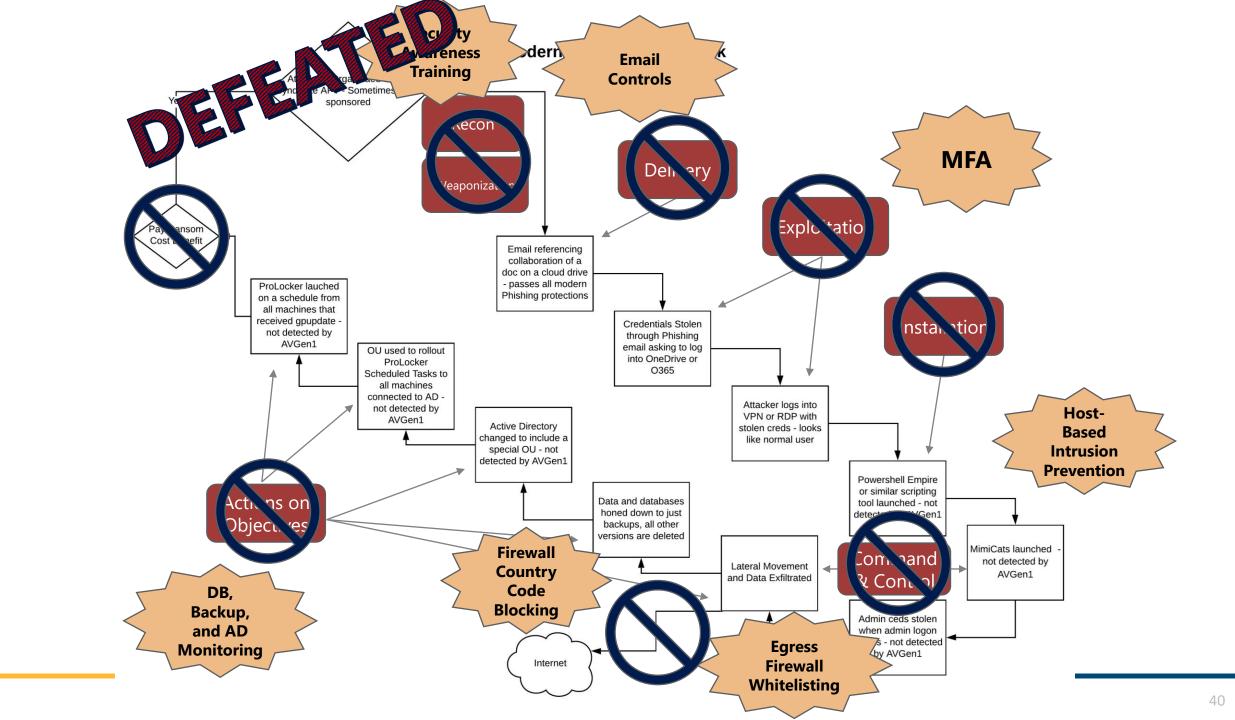


Store your backups on TWO different types of media



**ONE** copy air-gapped.





















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# Testing Your Controls

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- ✓ Offensive Security
- ✓ Ethical Hacking
- ✓ Exploiting Vulnerabilities
- ✓ Penetration Tests
- ✓ Black Box Testing
- ✓ Social Engineering
- ✓ Web App Scanning



- ✓ Improve detection and defense.
- ✓ Sharpen skills of Team members.
- ✓ Identify security weaknesses



- ✓ Defensive Security
- ✓ Infrastructure Protection
- ✓ Damage Control
- ✓ Incident Response (IR)
- ✓ Operational Security
- √ Threat Hunters
- ✓ Digital Forensics



IP Address		
Images / Videos / Docs	Protected by Cloud Services	O WiGLE: Wireless Network Mapping
	AAIIGIG22 LAGEMOLK ILIIO	OpenCellid: Database of Cell Towers
Social Networks		
Instant Messaging		Wireshark
People Search Engines	Network Analysis Tools O	NetworkMiner
	IP Loggers	Packet Total NetworkTotal
Dating		Olvetworklotal
Telephone Numbers (		RecruitEm
Public Records	Annual Reports	LinkedIn
	General Info & News	Market Visual
Business Records (		Jobster
Transportation		XING Indeed
Geolocation Tools / Maps		IntelTechniques Resume Search
Search Engines ( Forums / Blogs / IRC		CVGadget
OSINT Framework O Archives		C LeadFerret.com
Language Translation		
Metadata		OnionScan
Mobile Emulation		Tor Scan
Terrorism	Discovery O	Onioff Hunchly Hidden Services Report
Dark Web		docker-onion-nmap (T)
Digital Currency	TOR Directories	Onion Investigator
Digital Cultericy	9.5	r2web CA Dark Web Investigation Support
Classifieds	OIA	https://openphish.com/feed.txt
Encoding V Consider	Phishing O	PhishTank
Encoding / Decoding	IOC Tools	PhishStats
Tools		
		M X-Force Exchange
Malicious File Analysis		alware Information Sharing Platform
Exploits & Advisories		alware Patrol piect Honey Pot

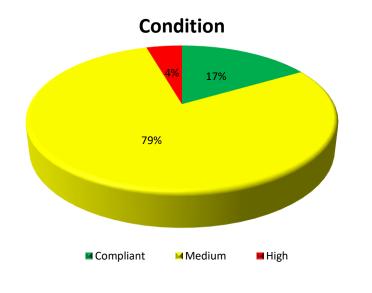


## **Purple Team**

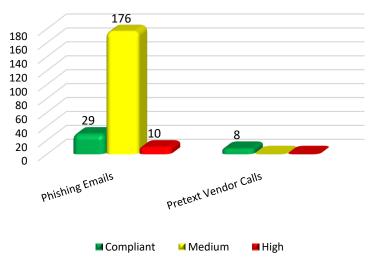
Audit Agency	Action Items: Recommendations and comments	Risk Code
SBS Network Security	During the phishing email testing, auditors sent 424 spoofed emails to Client employees. The objective was to test the employee handling of phishing email communications. Auditors subsequently, received confirmation of 76 visits to the phishing website via links clicked within the phishing emails. In addition, 23 employees disclosed usernames and passwords during the time of testing.	High
	<b>RECOMMENDATION (High)</b> : The Client should continue to provide employee training regarding the recognition and proper handling of suspicious, spoofed, and/or phishing email communications.	

The SBS Network Security Team assessed both the internal and external security controls.

- Phishing Emails: Out of the two hundred fifteen (215) email addresses that received the phishing email, a total of one hundred eighty-six (186) employees visited the phishing website, and of those visits, ten (10) employee submitted information such as username, password, or organization name to the phishing website.
- Pretext Vendor Calls: Out of eight (8) attempts made by a social engineer to retrieve internal network information, all employees denied releasing internal network information to the social engineer due to proper verification methods and employee training.



#### **Social Engineering Summary**



## **Purple Team**

Audit Agency	Action Items: Recommendations and comments Management Comments (if applicable)	Risk Code
SBS Purple Team Assessment	Auditors were able to perform a LLMNR / NBT-NS / mDNS poisoning attack on the Client's internal network. This resulted in the capture of multiple user's password hashes. These password hashes were then cracked and used to gain access to domain resources.  RECOMMENDATION (High): The Client should consider the risk associated with allowing LLMNR / NBT-NS / mDNS lookups to occur on the domain. If no operational necessity exists, then the Client should disable these features.	High
SBS Purple Team Assessment	Auditors were able to perform a Kerberoasting attack, resulting in the capture of several service account password hashes. At least one hash was cracked during testing.  RECOMMENDATION (High): The Client should consider granting the least privileges necessary for each service account. An inventory of service accounts should be created to document services and applications accessible by each account. Ensure that all service accounts utilize 14-character, complex passwords that are rotated periodically to reduce exposure.	High
SBS Purple Team Assessment	The auditor was able to exfiltrate data from the network through HTTPS protocol and presumably through other protocols masked as port 443. This issue being undetected is a high risk due to common exfiltration methods used by attackers and the risk of evil insider DLP theft of intellectual property.  RECOMMENDATION (High): SBS recommends data stream logging in Fortinet and alerts on large egress uploads from network. Additionally, there might be a Carbon Black watchlist that could be implemented instead or in conjunction to a firewall alert.	High
SBS Purple Team Assessment	Through our testing this week, some visibility issues have been uncovered. The first finding identified under visibility is Network scanning and on-network recon including actions on targets.  RECOMMENDATION (High): SBS recommends implementing a honeypot to expose this type of activity that doesn't currently trigger EDR and MDR tools. Further, SBS recommends extending Red Canary's capability to ingest windows logs at least from your DC and file servers. Windows Defender License should take care of most of the lack of visibility. Sysmon as a great addition for extending DC logging additionally. Lastly, SBS Recommends implementing critical Carbon Black Watchlists.	High

## **Purple Team**

#### **Client Blue Team Wins**

- MFA is as expected
- SMB Relaying was unsuccessful Client had SMB signing enabled and NTLMv1 disabled
- LDAP IPv6 Attack was unsuccessful due to LDAP signing
- Relaying LDAP with Impacket script to add computer to domain was unsuccessful due to SMB signing
- SAM Dump with compromised account was unsuccessful due to restrictive domain access
- PSExec attack was unsuccessful due to Windows Defender
- Privilege Escalation was unsuccessful due to restrictive domain access (SAM Dump, CrackMapExec, MimiKatz)
- Introduction of malicious code onto domain resource was unsuccessful due to Carbon Black Detection and Protection
- SSH/SFTP Exfil was blocked by firewall rules
- Deleting of files from network shares triggered alerting

## M365 Hardening

Action Items: Findings & Recommendations			
Upon review of the Institution's Global Administrator (GA) accounts, it was determined one account has been provisioned into Microsoft 365 as Domain Administrator (DA) account. Having cloud-only accounts will help ensure that in the event of a breach in the cloud, the breach does not affect the on-prem environment and vice-versa.	It is recommended the Institution create all Global Administrator (GA) accounts as cloud-only accounts. Additionally, the Institution should ensure passwords for these accounts are not set to expire by setting a password expiration policy of 90 days.  Guidance: Cloud Accounts  1. Log in to https://admin.microsoft.com as a Global Administrator.  2. Select Users > Active users then sort by the Licenses column.  3. For each user account in an administrative role verify the following:  o The account is Cloud only (not synced)  o The account is assigned a license that is not associated with applications (Azure Premium P1, Azure Premium P2)  Guidance: Password Expiration  1. Expand Settings then select the Org Settings subcategory.  2. Click on Security & privacy.  3. Select Password expiration policy ensure that Set passwords to never expire (recommended) has been checked.	High	
Upon review of the Global Administrator accounts, it was also determined that a "Break Glass" account had not been configured for access to the M365 Tenant in case of an emergency. An emergency such as federation services are unavailable, Multi-Factor Authentication (MFA) services are unavailable, and cell-networks are not available.	It is recommended the Institution have an alternate Global Administrator (GA) account intended for use in emergency situations. The username and password credentials should be stored in a dual-control access environment, requiring two (2) staff to access the credentials and documentation of who has access to the credentials. These types of emergency accounts are not normally accompanied by Multi-Factor Authentication due to the risk of overcomplicating the recovery process during an emergency.	High	

## **M365** Hardening

Action Items: Findings & Recommendations		
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While the Institution does have Conditional Access policies configured, the Institution does not enforce devices must be domain joined devices to access particular apps (i.e., OneDrive Sync).	It is recommended the Institution only allow devices that are joined to the corporate domain(s) to connect with resources within the M365 tenant.	Medium
While the Institution has enabled this feature (Password Protection for Azure Active Directory) within M365, the settings is not currently "Enforced."	It is recommended the Institution change the settings to "Enforced."	Medium
While the Institution does have a Conditional Access policy to block legacy authentication, the policy has not been turned "On" (Enabled).	It is recommended the Institution enhance the existing policy for blocking legacy authentication and turn "On" (Enable) the policy.	Medium
While the Institution has implemented Azure AD Connect for synchronization, Password Hash Sync has not been "Enabled."	It is recommended the Institution set the Password Hash Sync value to "Enabled", within Azure AD Connect sync.	Medium

## **Password Audit**

	Action Items:	
Audit Agency	Recommendations and comments	Risk Code
	Management Comments (if applicable)	
SBS Password Audit	A review of accounts configured within the Active Directory environment revealed twenty-seven (27) active	Medium
	accounts whose passwords are set to never expire. When passwords don't expire there is an increased	
	risk of account credentials being compromised and/or used inappropriately. RECOMMENDATION	
	(Medium): The Client should document the business purpose for all generic accounts and the	
	requirements for exemption of password expiration policies. In addition, all administrative accounts should	
	be configured to adhere to password expiration policies.	
SBS Password Audit	Auditors reviewed the hashed password values for all domain accounts for uniqueness. A unique hash	Medium
	value indicates a unique password has been configured for the account. Five (5) accounts were	
	identified as being configured with non-unique passwords, which increases risks associated with	
	password sharing, guessing, and account compromise. RECOMMENDATION (Medium): The Client	
	should ensure all user accounts are configured with unique passwords to mitigate risks of account	
	compromise and/or privilege escalation.	
SBS Password Audit	Auditors tested the password strengths of sixty-nine (69) active accounts configured within the Client's	Medium
	Active Directory environment and were able to successfully break or decrypt nine (9)	
	passwords. RECOMMENDATION (Medium): The Client should ensure user training regarding password	
	security is accomplished and the use of dictionary-based passwords should be discouraged. In addition,	
	the Client should encourage the use of passphrases where possible and all passwords / passphrases	
	should contain characters from each of the following categories: uppercase, lowercase, numerical digit,	
	special character.	
SBS Password Audit	The Client's domain user password length is currently set to twelve (12) characters with complexity	Medium
	enabled. Through password cracking efforts, auditors identified five (5) passwords that did not meet	
	the Client's password length requirements.	
	RECOMMENDATION (Medium): The Client should ensure all active account passwords are changed to	
	adhere to the domain password policy.	

### **Incident Readiness**

Task	Category	Risk	πι	Details
Active Directory Monitoring and Alerting	Detection, Response		Low	SBS recommends the Organization implement a tool to monitor and alert changes made to Active Directory. AD changes are a major Key Risk Indicator (KRI) for possible Indicators of Compromise (IoCs), especially if the changes don't match your change management logged changes or if IT cannot identify who physically made the change.  - Disable Null Sessions (https://www.blumira.com/integration/how-to-disable-null-session-in-windows/#:~:text=Disable%20Null%20Sessions%20via%20Group%20Policy&text=Enable%3A,of%20SAM%20accounts% 20and%20shares)Disabled)  - Disable NTLM Authentication (https://www.csun.edu/it/ntlmv1#:~:text=Disabling%20NTLMV1,disable%20NTLMv1%20through%20the%20registry)  - Disable Guest Account  - Rename Administrator Account  - Audit Access of Global System Object  - Disable Microsoft Network client: Send unencrypted password to third-party SMB servers  - Set all event logs in Group Policy to audit for: Information, Warning, Error, Success Audit, Failure Audit
Alerts vs. Reporting for Logging	Detection, Response	High	High	It is recommended the Organization utilize the logging system to create alerts for specific Key Risk Indicators (KRIs) for proactive incident triage rather than relying on reviewing reports for reactive incident triage. Further, define each KRI so they have a criticality. High criticality alerts should go to all IT and Security team members. Medium criticality alerts should go to all security members.
Backup Changes Alerting	Detection, Response	High	Low	SBS recommends the Organization implement alerting on changes to the backups and backup system. This is an important Key Risk Indicator (KRI) as it can indicate someone has deleted a backup, which can be part of a multi-attack incident such as Ransomware. Once alerted, the IT staff can check to see if it was an approved change from change management. If not, it could be an indicator of compromise (IoC).
Bring Visibility with Logging and Alerting to Cloud Resources	Detection, Response	High	Medium	SBS recommends the Bank implement logging and alerting on cloud assets such as MS365 with webhooks or APIs to make sure visibility for detection is gained withing those assets.

### **Incident Readiness**

Task Deploy Firewall Egress Filtering	Category Protecti On	Risk High	m Mediu m	Details  SBS recommends looking at the protocols that have no business use, such as TOR and blocking them from leaving the network. TOR is used in Ransomware to send and receive the encryption key and can also be used by nefarious insiders to hide Internet activity. This control can further decrease risk by implementing geolocation blocking on the egress or whitelisting all traffic used for business.
Deploy Multi-Factor Authentication (MFA) and Teach Users Denying is Okay	Protecti on	High	Mediu m	SBS recommends MFA be deployed on all access coming from outside the Organization's perimeter and to all cloud items. This single control decreases security risk immensely across the entire enterprise. In places where employees don't have easy access to their cell phones, it is a good idea to use biometrics or proximity cards. Employees should be taught that denying a login authentication they didn't directly make is important to the Organization's security. SBS recommends the Bank continue to roll out MFA to all users. At the very least, it should be rolled out to all external access and all administrative security task accounts.
Immutable Backups	Protecti on	High	High	SBS recommends the Organization move to an immutable backup solution or store offline backups in a immutable cloud solution such as Wasabi or AWS Backup. This will decrease the risk of not being able to recover from a ransomware attack.
M365 Licensing Upgrade - Protection, Detection, and Response Considerations	Protection , Detection, Response		Mediu m	SBS Recommends upgrading the M365 license to Business Premium. This upgrade would gain the Organization Conditional Access allowing them to implement MFA for email access, allow Geoblocking on countries outside the US, MS Defender security suite, and would give the Organization Intune which is a Mobile Device Management solution used to control mobile device actions such as device passcode, device encryption, and device update alerts. This would effectively decrease the risk of mobile device attacks, lost or leaked company data, credential theft, and business email compromise.

### **Incident Readiness**

Task Insurance Review Item 06	Category Protection	Risk High	Low	Details  According to EXCLUSIONS RELATING TO ALL INSURING CLAUSES, section 30, Willful or dishonest acts of senior executive officers, xxx will not reimburse you for costs arising directly or indirectly out of any willful, criminal, malicious or dishonest act, error or omission by a senior executive officer as determined by final adjudication, arbitral tribunal or written admission. This can be an issue with Evil Insider threats such as internal fraud or intellectual property theft. More clarification is needed.
Lock Down Scripting on Virtual Machines	Protection	High	Medium	SBS recommends taking the scripting protection out of audit mode and putting it into protection mode to offer better protection against attackers running scripts inside your environment.
Add Two Additional IT FTE	Protection, Detection and Response, Recovery	High	High	SBS recommends bank hire two additional IT/IS resources. The security employees are currently doing some IT tasks and need to be freed up to focus 100% on security. Additionally, there are too many ongoing and future projects that are necessary to the security of bank that are in danger of being delayed or not deployed at all due to resources. Further, burnout is a real issue in IT and Security. Constantly having IT/IS resources that are putting in 50 plus hours a week might take bank backwards or cause further delays if someone were to leave the organization. In cybersecurity, your people are your most important resource.
Implement Central Logging or SIEM	Protection, Detection, Response	High	High	SBS recommends the Organization implement a central logging server with alerting capabilities or a SIEM product to increase visibility of Key Risk Indicators (KRIs) and Indicators of Compromise (IoCs). Some SIEM solutions are Log Rhythm, Blue Voyant, Alien Vault, and many more. Logging only solutions may include The Onion (free), syslog (free) but needs a meta service to convert Windows logging format to syslog, and many other free or paid options.

https://sbscyber.com/resources/hacker-hour-ai-unveiled-tackling-the-early-risks-of-ai-technology

https://sbscyber.com/resources/top-six-controls-to-mitigate-a-ransomware-attack

https://sbscyber.com/resources/fintech-and-vendor-management-guidance

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