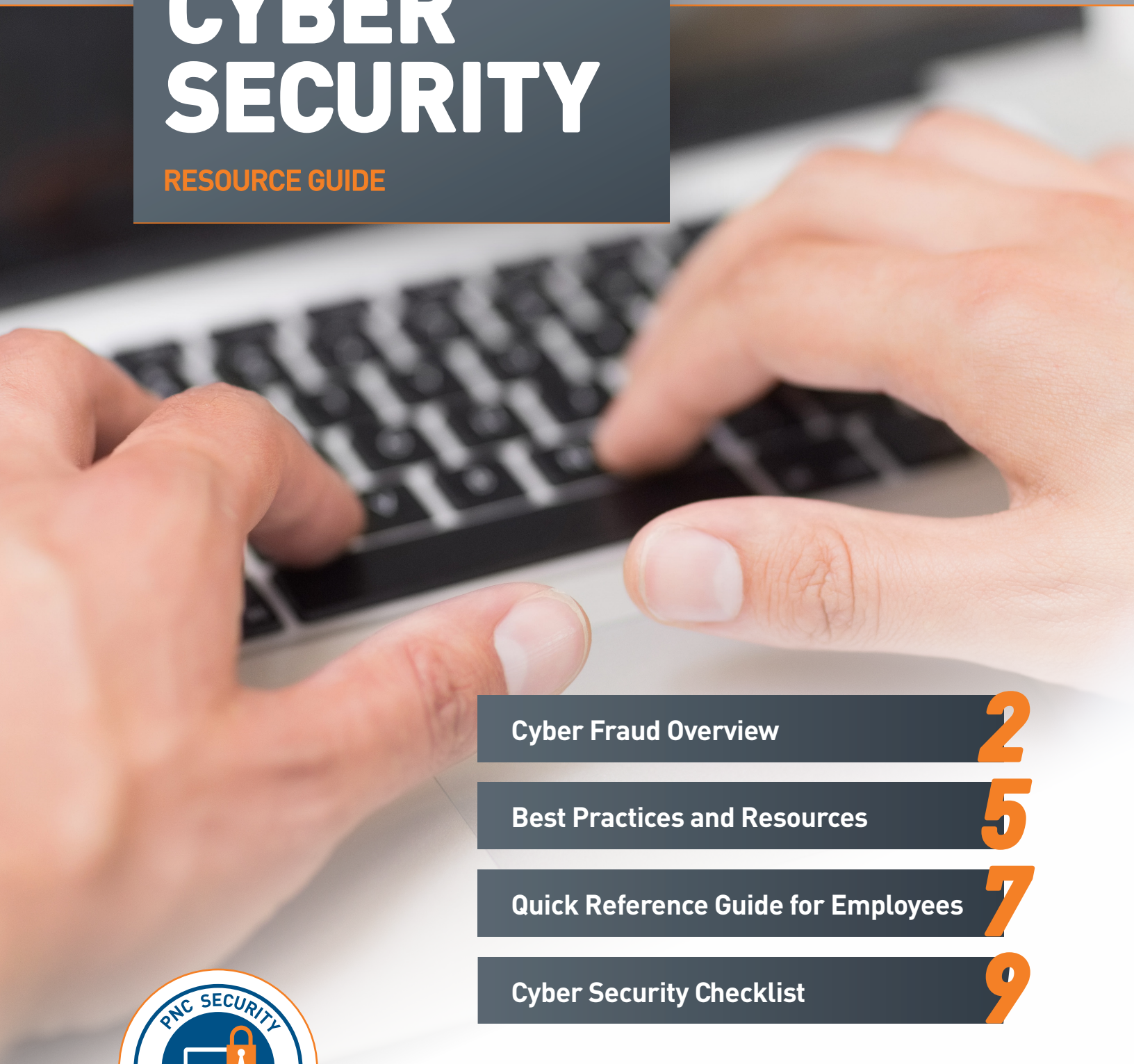
CORPORATE & INSTITUTIONAL BANKING

CYBER SECURITY

RESOURCE GUIDE



PNC SECURITY AWARENESS

PNC

AWARENESS OF CYBER THREATS FOR PAYMENTS FRAUD

Payments fraud attempts are widespread across all industry types as a result of email compromises and financial malware infections. Understanding how these fraud schemes are designed to infiltrate/compromise your business and taking action to prevent them are critical to your defensive strategy.

It has become imperative that employees with access to funds movement services become aware of these fraud schemes and can recognize potentially fraudulent or malicious activity against their email or PINACLE® login credentials. These are very real threats, and we encourage you to educate staff throughout your organization.

ATTEMPTED PAYMENTS FRAUD VIA EMAIL COMPROMISE

Cybercriminals initiate fraudulent payment requests or requests to change payment instructions from email accounts that appear to be from a company executive (such as the CEO or CFO) or from a known external partner, such as a supplier. The fraudulent "From" email address may be a fictitious email address in the executive's name or it may be a slight variation of a legitimate supplier email address, which can trick the recipient into believing that the fraudulent communication is valid. It is also possible that the sender's legitimate email account has been compromised, making it essential that employees are able to recognize the characteristics of a fraudulent payment request.

Also be mindful that even when an email account is not compromised, there is quite a lot of information available in "Open Source" records (social media, public records) that cyber criminals can obtain easily in developing such schemes. Examples include when a University or Hospital (schemes are certainly not limited to such entities) awards a construction contract, which is disclosed in public filings. Cyber criminals can access these records, register a website impersonating the legitimate contractor, and (usually waiting several months for contract to commence) initiate communication with University/Hospital (also identifying Accounts Payable contacts via Open Source records) introducing a "new" accounts receivable contact and account number set up specifically for this contract.

In such schemes, the cyber criminals don't need to know the amount of the upcoming payment or even the projected date for the payment. Instructions sent typically state that "All payments going forward should be made to the new account number and to the attention of the new accounts receivable contact." As construction contracts are typically paid in net 30-, 60- or 90-day increments, often the victims are not made aware of the fraud until weeks if not months have passed, making recovery of funds extremely difficult. These types of schemes often involve losses in excess of $1 million dollars.

RECOGNIZE THE TYPICAL EMAIL FRAUD REQUEST SCENARIOS

- A supplier requests changes to payment instructions for an upcoming payment.
- An email appears to be from a company executive to initiate an urgent payment — typically for an acquisition, investment, payment or some other confidential reason.
- An email appears to be from a company executive delegating authority to an attorney or other external party for the purpose of providing payment instructions.

RECOGNIZE THE WARNING SIGNS OF AN EMAIL COMPROMISE

- Fraudulent emails will typically request that the recipient take one or more of the following actions:
  - Bypass established payment initiation and approval procedures
  - Keep the payment confidential
  - Provide immediate confirmation (to requestor) when the payment is executed
  - Communicate with the requestor only via email
- The requests will often warn of serious repercussions for failure to comply.
- Many times the executive appearing to be requesting the payment is out of the office or unavailable (which the fraudsters have previously determined).
- The request varies from the typical payment pattern for the company or the sender.
- The recipient should ask:
  - Does the CEO (or other executive) routinely communicate payment requests via email?
  - Is the request consistent with other emails from the sender?
  - Are the email signature and tone consistent with other emails from the sender?

TAKE ACTION TO HELP PROTECT AGAINST THIS THREAT

- Train your employees to be vigilant when reviewing and confirming payment requests, especially those conveying a sense of urgency and/or insisting on secrecy.
- Establish formal policies, procedures and controls for all payment initiation requests and additions/changes to your accounts payable (A/P) system.
  - Executive management should communicate and follow the policies and procedures.
  - Employees should be trained and empowered to recognize requests that deviate from the established procedures and obtain confirmation of such requests from the requestor in person or via a known telephone number.

PNC

DANGEROUS FINANCIAL MALWARE INFECTIONS

Dangerous financial malware variants that are unknowingly downloaded by employees after they open an infected attachment or click on a malicious link in a phishing email often have generic subject lines, such as "Invoice" or "Resume," or link the recipient to a server to retrieve a document.

Once the malware has been installed on a computer, it redirects a user's online banking sessions to a malicious site that harvests access credentials, such as User ID, Operator ID, Password, Security Question responses and Token Passcode.

It is important to know that **financial malware is often not detected by antivirus software**.

RECOGNIZE THE WARNING SIGNS OF A MALWARE INFECTION WHEN USING PINACLE

- A malware infection may cause an operator to be:
  - Unable to log in due to screens that delay or redirect the typical login experience.
  - Prompted to provide their token passcode or security question responses repeatedly or presented with a "System Unavailable" message during the login process.

    PINACLE will never prompt an operator to enter login credentials (including a token passcode or security question responses) multiple times during the login process.
  - Instructed to have another operator log in from the same computer as part of a security process or to reactivate/unlock another ID.

    PNC will never request that a PINACLE operator have another PINACLE operator log in from the same computer during an online banking session or require another operator to log in from the same computer to reactivate/unlock an ID.
  - Experiencing problems logging in to PINACLE. Subsequently, the operator may receive a call from someone purporting to be from PNC asking for login credentials (such as a password or token passcode) or asking to have another operator log in from the same computer in order to resolve the problem.

    PNC will never ask for login credentials or request that a second user log in to resolve an issue.

TAKE ACTION TO HELP PROTECT AGAINST THIS THREAT

- Verify the authenticity of the communication before opening attachments or clicking on links in any emails that are from an unknown sender or are not an expected communication. Contact the sender at a known telephone number to confirm that the suspicious content was indeed sent to your attention.
- Use a dedicated computer with no email access and limited internet access for payment initiation or online banking access.
- Installing anti-malware software is highly recommended.
  - **PNC offers IBM® Security Trusteer Rapport® as a free, optional security tool** to help safeguard your PINACLE login credentials from phishing attempts and to remove certain malware from your computer. Download and install Trusteer Rapport by visiting the link below. To learn more, please visit the PINACLE Security Center by clicking on the blue shield icon located at the upper right corner of any PINACLE page.

    LINK: www.pnc.com/en/security-privacy.html

- **If you experience any of these scenarios or if any similarly suspicious behaviors occur during a PINACLE session, your computer may be infected with malware. Please contact Treasury Management Client Care immediately at 1-800-669-1518, Option 1.**

PNC

AVOID BEING A STATISTIC

INCREASE THE SECURITY OF COMPUTERS AND PASSWORDS

- Use strong passwords.
- Don't recycle User IDs or passwords.
- Require password changes every 30–90 days.
- Ensure that antivirus software is current and is set to update automatically.
- Install Trusteer Rapport Malware Detection Software (additional information is available in the PINACLE Security Center).
- Use dedicated computers for PINACLE access (no email and restricted website access).

EDUCATE EMPLOYEES

- Institute cyber security and awareness training for all employees.
- Communicate new cyber trends and alerts.
- Conduct fake email campaigns to test employees' ability to recognize phishing emails.

THE STATISTICS

78% of companies were targets of payments fraud in 2017.

74% of organizations' check payments were subject to fraud attempts/attacks in 2017.

77% of companies were exposed to business email compromise in 2017 — a 3 percent increase from 2016.

54% of companies that experienced payments fraud via business email compromise did so via wire transfers.

32% of survey respondents reported that incidents of fraud attempts increased in 2017.

Source: 2018 AFP Payments Fraud and Control Survey — Report of Survey Results

PNC

IMPLEMENT PAYMENTS FRAUD SOLUTIONS

The Association of Financial Professionals reported that 78% of organizations were victims of payments fraud in 2017 and adopted a stronger form of authentication or added layers of security for access to bank services.

PNC offers the following solutions:

- **Positive Pay and Payee Positive Pay**
  Matches checks presented for payment against your check issue file; those checks not matching your issue information are presented to you for a pay/return decision through PINACLE.
- **ACH Positive Pay**
  Allows you to monitor and control ACH debit activity by establishing "rules" that filter the ACH debits coming into your account(s). Using PINACLE, you review "suspect" ACH debits and determine whether to return them as "unauthorized."
- **ACH Debit Block**
  Restricts all ACH debits from posting to an account.
- **PINACLE Current Day Information Reporting**
  Provides intraday information to help you monitor activity within your accounts.

ENHANCE INTERNAL POLICIES & PROCEDURES

- Establish formal policies and procedures for payment processing and Accounts Payable changes. For example:
  - Require a verbal callout verification process for any vendor payment instruction change request.
  - Require secondary approval (internally) for all payment requests, payment instruction changes and changes to your Accounts Payable (A/P) system.
  - Use a third layer (e.g., executive approval) for high-dollar transactions.
  - Segregate A/P system updates and payment initiation functions.
- Review PINACLE security features, controls and operator entitlements:
  - Ensure that funds movement entitlements are appropriate for each employee's job function.
  - Segregate payment initiation and payment approval functions.
  - Implement secondary operator approval of all entitlement changes ("20A") for payment services.

ADDITIONAL RESOURCES

PNC Security & Privacy

Information and videos about current fraud trends and best practices

LINK: www.pnc.com/en/security-privacy.html

PINACLE Security Center

Access to important information, updates and tips about how to keep your business safe from cyber fraud

LINK: Click the icon to log on to PINACLE

PNC Ideas, Insight & Solutions

Articles and white papers and best practices

LINK: www.pnc.com/ideas

FBI Internet Crime Complaint Center

Business and consumer fraud alerts, tools to report fraud to the FBI, frequently asked questions, tips and best practices

LINK: www.ic3.gov
www.ftc.gov
www.staysafeonline.org

FDIC's "A Bank Customer's Guide to Cybersecurity"

What consumers can do to help protect themselves from cyber fraud

LINK: www.fdic.gov/consumers/consumer/news/cnwin16/FINAL_Color_CN_Winter2016.pdf

PNC

CYBER SECURITY & AWARENESS
QUICK REFERENCE GUIDE

VERIFY AND VALIDATE

- Verify email payment or payment change requests in person or via a known phone number.
- Do not reply to an email to validate a request.
- Do not use contact information provided in an email to validate a request.
- Verify authenticity of an email before opening attachments or clicking on links.

INFORMATION PROTECTION

- Be cautious about sharing information via social networking sites.
- Limit executive contact information on the company website.
- Do not confirm or provide personal information in response to an email or a text message.
- Do not give out personal information over the phone to unknown sources.
- Do not share executive travel/ vacation schedules with unknown sources.

BUSINESS EMAIL COMPROMISE (BEC) DETECTION

- Be suspicious of any vendor change in payment instructions.
- Inspect email header and look for alterations (e.g., the use of two "Vs" to look like a "W").
- Be mindful that the "From" name in your inbox can mask a fraudulent email account.
- Be suspicious of messaging that is urgent and/or that requests secrecy.
- Be suspicious when the sender advises that they can only be reached via email.
- Be suspicious of emails requesting that payments be sent to new accounts or mailing addresses.
- Be sensitive to emotionally charged communications.
- Be suspicious of emails with generic subject lines (e.g., "Your Documents" or "Invoice").

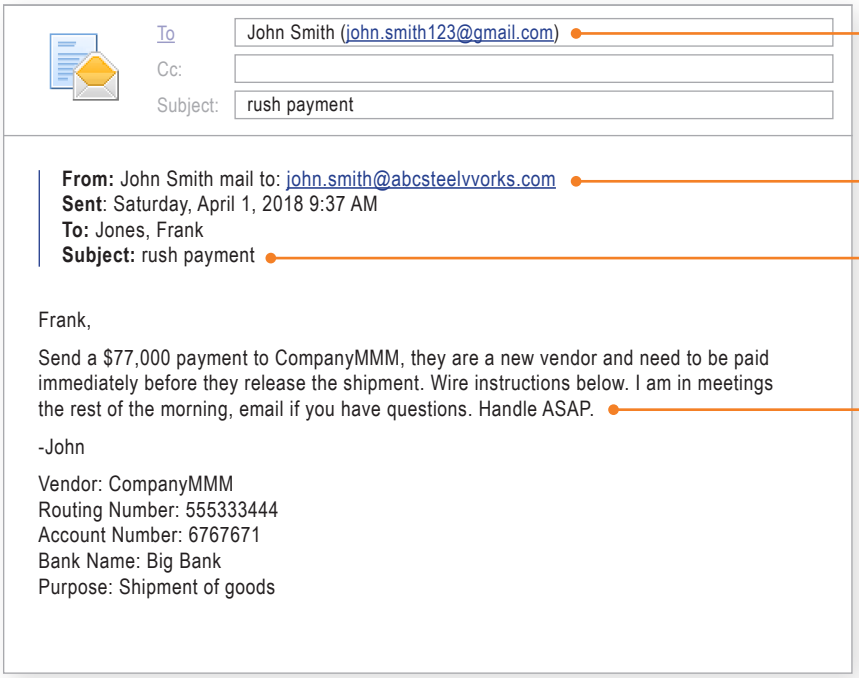
COMMON BEC RED FLAGS

	COMPROMISED INTERNAL EMAIL	COMPROMISED VENDOR EMAIL	FINANCIAL MALWARE	CHECK / WIRE SCAM
Appears to Come From	Company Executive	Existing Vendor	External Business Partner or Vendor	New Customer
Red Flags	• Urgent, confidential request • Requestor can be reached only via email	• Requests payment using new account or payment instructions	• Email request to log into online banking using link provided in the email • Online banking login: - Multiple prompts for password/token - Requires second user to log in on same computer	• Overpayment by check or card (non-guaranteed funds) with request for refund via wire transfer (guaranteed funds)
Result	• Payment sent to fraudster	• Payment sent to fraudster • Vendor relationship disrupted	• Fraudster obtains login credentials and initiates payment on real bank site	• Company loss of funds reimbursed to fraudster • Check or fraud payment received is invalid

EXAMPLES

PRINT THIS PAGE FOR EASY REFERENCE.

FRAUDULENT "SPOOFED" EMAIL



To: John Smith (john.smith123@gmail.com)
Cc:
Subject: rush payment

From: John Smith mail to: john.smith@abcsteelvvorks.com
Sent: Saturday, April 1, 2018 9:37 AM
To: Jones, Frank
Subject: rush payment

Frank,

Send a $77,000 payment to CompanyMMM, they are a new vendor and need to be paid immediately before they release the shipment. Wire instructions below. I am in meetings the rest of the morning, email if you have questions. Handle ASAP.

-John

Vendor: CompanyMMM
Routing Number: 555333444
Account Number: 6767671
Bank Name: Big Bank
Purpose: Shipment of goods

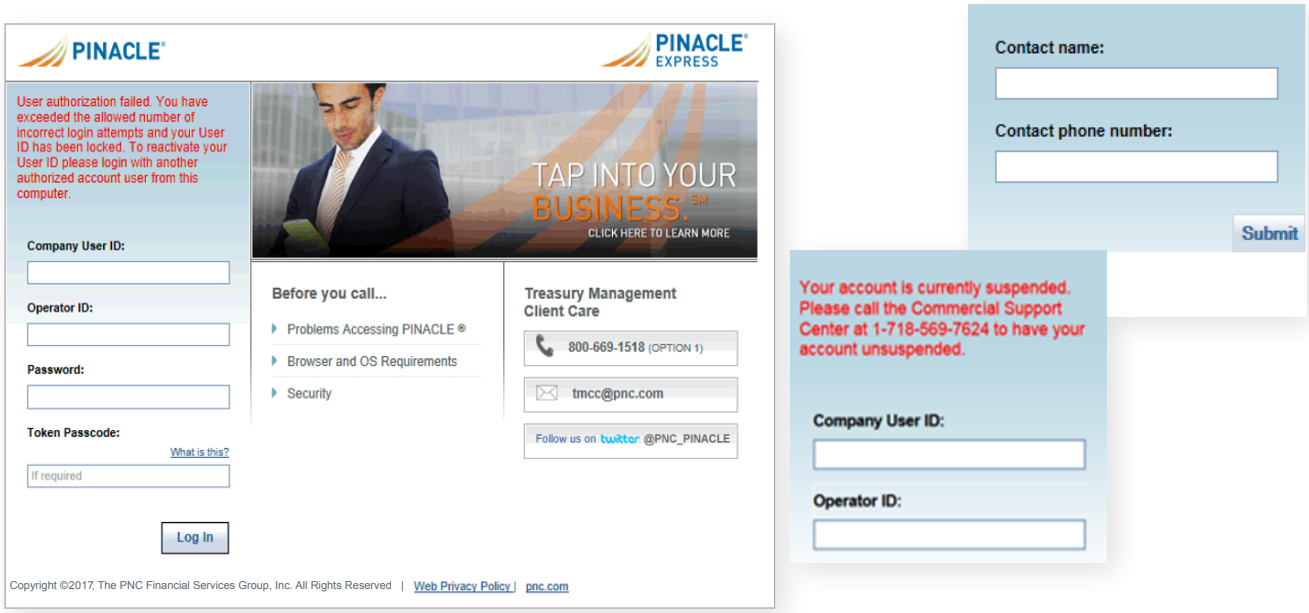
When you "Reply All," the email address appears differently

The "w" in the company name is spelled with two "v"s

It's an urgent request

The requestor is available only via email

FRAUDULENT "SPOOFED" ONLINE BANKING PAGE



PNC

YOUR CYBER SECURITY CHECKLIST

COMPUTER AND PASSWORDS	✓
⚠ Has your company downloaded Trusteer Rapport malware detection software that is available free through PINACLE?	
Does your company require regular password changes every 30 to 90 days?	
Is your company's antivirus software up to date, enabled and set to auto-update?	
Does your company have a dedicated computer for online banking that is not used for email or general internet browsing?	
Does your company utilize any Positive Pay services?	
Does your company use any other fraud surveillance tools or services?	
ENHANCED INTERNAL POLICIES & PROCEDURES	
⚠ Has your executive team reinforced with your payment processing team in writing that all employees, including themselves, must strictly follow the payments processing requirements, policy and procedures?	
Does your organization have formal policies and procedures in place for requesting payments and making additions/changes to your Accounts Payable (A/P) system?	
Does your company require secondary approval for all payment requests?	
Does your company require secondary approval for changes to payment instructions in bank and vendor payment systems?	
Does your company require third-layer, executive approval for high-dollar transactions?	
VERIFY AND VALIDATE	
⚠ Are email payment or vendor payment change requests confirmed by phone with the vendor using contact information on file (vs. contact information provided in the email request)?	
⚠ Are payment or wire transfer requests sent via email from internal executives/managers confirmed verbally using contact information on file (vs. contact information provided in the email request)?	
INFORMATION PROTECTION	
Does your company have a social media policy that employees must read and sign?	
Does your company limit executive contact information on the company website?	
Does your company prohibit giving out personal information, including executive travel schedules, over the phone to unknown sources?	
BUSINESS EMAIL COMPROMISE (BEC) DETECTION	
Do your employees review emails for possible fraudulent payment requests, verifying headers, addresses and generic subject lines?	
Are your employees cautious about email requests that are urgent and emotionally charged and when the recipient is available only via email?	
EMPLOYEE EDUCATION AND AWARENESS	
Do all employees with authorization to initiate and approve payment requests receive cyber security training?	
Do you provide regular alerts and updated training for employees regarding cyber trends?	

PNC

READY TO HELP

If you suspect or experience fraudulent activity, please contact PNC's Treasury Management Client Care immediately at **1-800-669-1518**, Option 1.

Or, if you would like to learn more about protecting yourself from payments fraud, contact your PNC Relationship Manager or Treasury Management Officer.