

# Addressing the Cybersecurity Issues and Needs of Rural Nonprofit Organizations

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# Main Topics

- Abstract
- Introduction
- Discussion of Survey to be Used
- Identifying Rural PA non-profits
- Survey Dissemination and Analysis of Data
- Examples of Survey Coverage
- Continuing Work and Conclusion
- Acknowledgements

# Abstract

- Cybersecurity competence has become a strategic focus for all types of organizations (large, small, for profit, nonprofit)
- Non-profits have unique challenges addressing cybersecurity readiness due to limited budgets and manpower
- Inadequate defenses make non-profits particularly vulnerable to ransomware, DDoS attacks and phishing attacks
- The problem is amplified for *rural* non-profits who have minimal/limited access to staff proficient in cybersecurity knowledge and skills
- We have developed a cybersecurity assessment process to ascertain key needs and weaknesses in cybersecurity
- We aim to offer “best practices” and content that can be easily implemented within budget and staff constraints

# Introduction

- Over 1.3 million non-profit organizations (NPOs) operating in the US
- >92% are small, community-based, and serve local needs
- They collect and store incredibly sensitive data about their donors and volunteers which may include:
  - Health records
  - Social security numbers
  - Personal information
  - Confidential emails
  - Resources
  - Billing information
- Lack of enforced safeguards and cybersecurity readiness results in vulnerabilities and threats for NPOs

# Introduction

## Recommended focus areas

- Applying current security standards to online donation forms
- Securing peer-to-peer donations without NPO connection
- Complying with security, authentication, and dispersal compliance
- Address security and access to the technology ecosystem

# Introduction

## McAfee Cloud Adoption and Risk Report 2020



↑ +50%

Overall cloud services usage



↑ +630%

Threats from external actors



↑ +47%

Data access and breach procedures

55.6% of NPOs do **not** require multi-factor authentication

(Source: Center for Rural Pennsylvania, <https://www.rural.pa.gov/>)

# Discussion of survey to be used

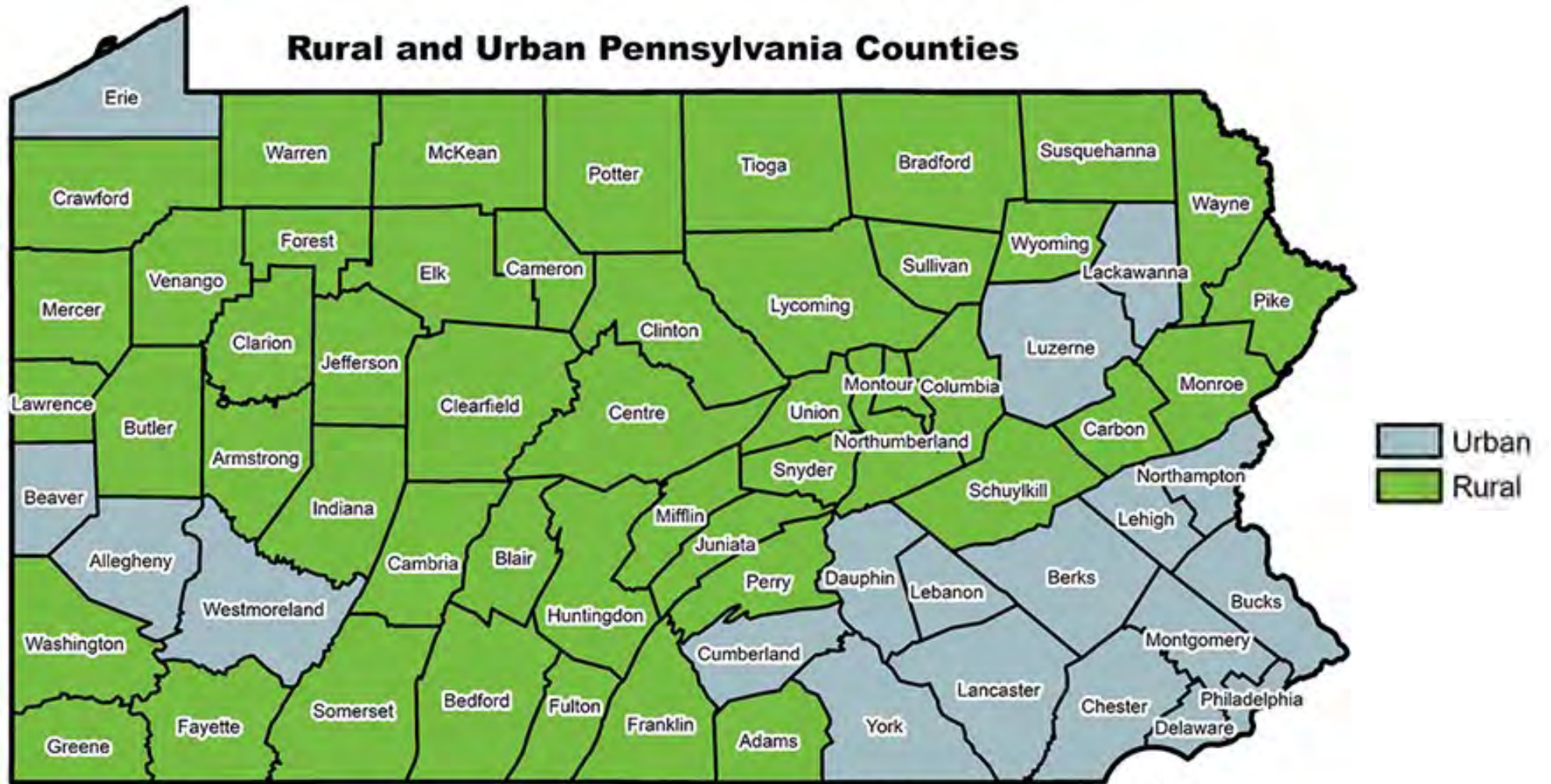
- Research team met weekly to discuss this initiative
- Compile potential survey questions in Microsoft Teams document
- Went through multiple iterations to categorize questions and fine tune wording
- Survey questions cover eight key areas:
  - 1) Internal vs. External IT services and resources
  - 2) Website security
  - 3) IT and Security budgeting
  - 4) Current risk environment
  - 5) Business continuity/disaster recovery plan
  - 6) Physical security
  - 7) Logical access control
  - 8) Inventory

# Discussion of survey to be used

Challenges	Approach
Surveys will be filled out by individuals with varying levels of cybersecurity expertise	<ul style="list-style-type: none"><li>• Limit excessive technical jargon</li><li>• Provide additional verbiage inline with question or include hover text to clarify question</li></ul>
Respondents may have limited knowledge about IT/cybersecurity policies	<ul style="list-style-type: none"><li>• Include “I don’t know” response option with “Yes/No” questions</li></ul>
Determining how many open-ended questions to include to keep respondents engaged with survey	<ul style="list-style-type: none"><li>• Converted some open-ended questions to multiple-choice questions</li></ul>
Choosing right tool for survey development and dissemination	<ul style="list-style-type: none"><li>• Qualtrics will be used as survey instrument<ul style="list-style-type: none"><li>○ Chosen over Google Forms and Microsoft Forms</li><li>○ Flexibility in implementing conditional logic to determine which questions are displayed</li><li>○ Extensive analytics capability</li></ul></li></ul>



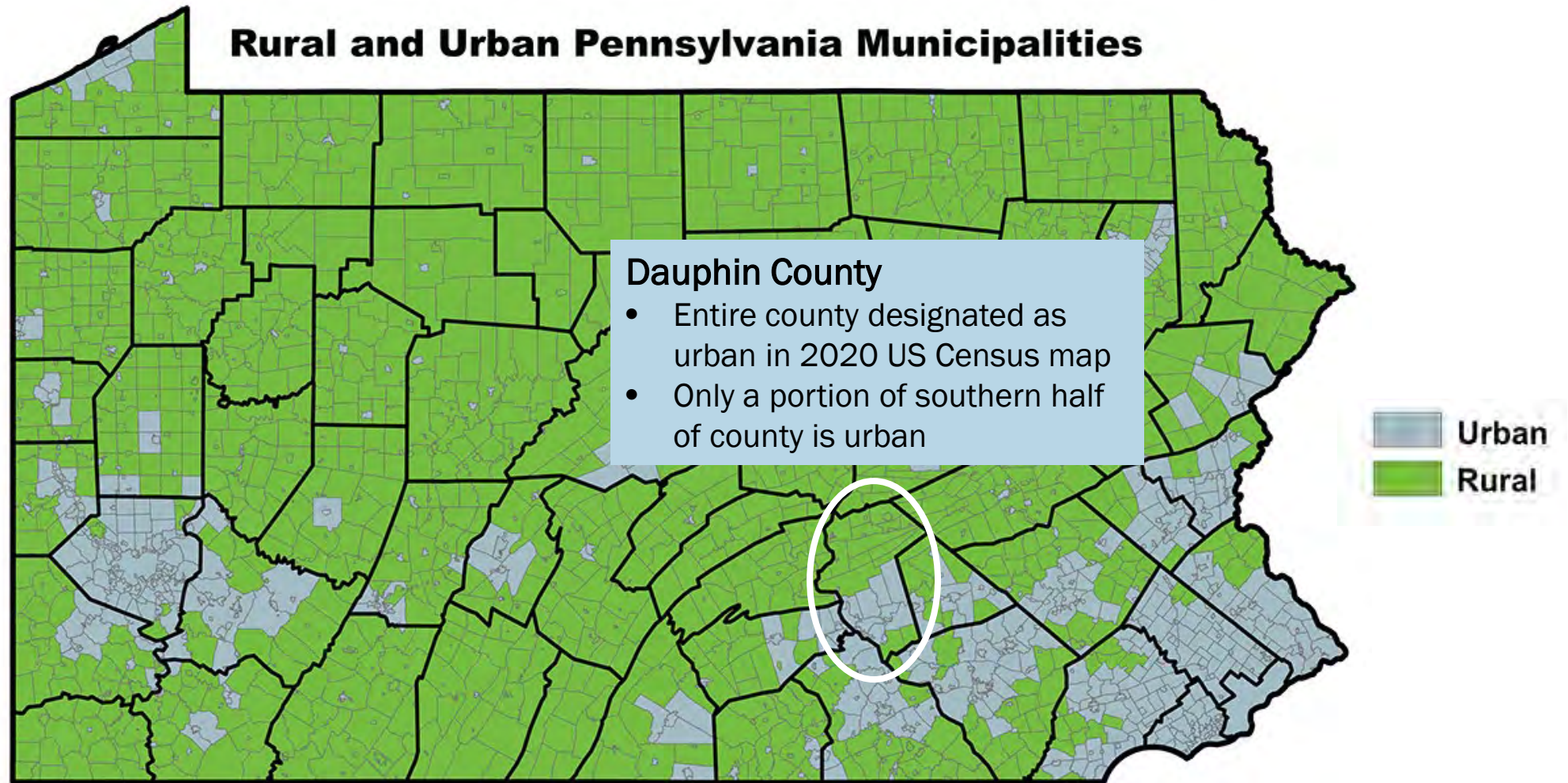
# Identifying Rural PA Non-profits



Data source: U.S. Census Bureau, 2020 Census.



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Data source: U.S. Census Bureau, 2020 Census.

# Identifying Rural PA Non-profits

Three primary websites consulted for information

- Center for Rural Pennsylvania
  - Provides breakdown of urban vs. rural municipalities by county
- TaxExemptWorld.com
  - Lists nonprofit organizations by county with address
- Pennsylvania Department of Community and Economic Development
  - Use nonprofit address info from TaxExemptWorld.com to lookup municipality

Key final step is to identify one or more primary contacts to target for our survey instrument

# Identifying Rural PA Non-profits

AutoSave On C3N Non-Profit Contact List.xlsx Saving... Search (Alt+Q) Gardner, Brian K

File Home Insert Draw Page Layout Formulas Data Review View Developer Help Acrobat Comments Share


K181 Unknown

	A	B	C	D	E	F	G	H	I
1	County	Organization Name	Status	Street Address	City	State	Zip	Municipality	Urban/Rural
107	Adams	Association Of Notre Dame Club Inc	Educational Organization	1625 Fish And Game Rd	Littlestown	PA	17340-9350	Littlestown Borough	Urban
108	Adams	Audrey Hawk Foundation Inc	Charitable Organization	1190 Fish And Game Rd	Littlestown	PA	17340-9738	Littlestown Borough	Urban
109	Adams	B A C A Of Gettysburg Inc	Charitable Organization	PO Box 333	New Oxford	PA	17350-0333	New Oxford Borough	Urban
110	Adams	B Guy & Mary R Smith Tr	4947(a)(1) - Private Foundation	PO Box 4566	Gettysburg	PA	17325-4566	Gettysburg Borough	Urban
111	Adams	Bakewell Farm	Educational Organization	460 Boyds Hollow Rd	Biglerville	PA	17307-9750	Biglerville Borough	Rural
112	Adams	Barlow Volunteer Fire Co Inc	Charitable Organization; Educa	2005 Taneytown Rd	Gettysburg	PA	17325-8718	Gettysburg Borough	Urban
113	Adams	Battery M 2nd U S Artillery Inc	Charitable Organization; Educa	1630 Stoney Point Rd	East Berlin	PA	17316-9718	East Berlin Borough	Rural
114	Adams	Beatrice O Pfeffer Trust Ua Dtd 3-26-80 Fbo Beatrice O Pfeffer	4947(a)(1) - Private Foundation	PO Box 4566	Gettysburg	PA	17325-4566	Gettysburg Borough	Urban
115	Adams	Benders Evangelical Lutheran Church	Religious Organization	1385 Rentzel Rd	Biglerville	PA	17307-9795	Biglerville Borough	Rural
116	Adams	Bendersville Community Fire Company Incorporated	Charitable Organization	PO Box 254	Bendersville	PA	17306-0254	Bendersville Borough	Rural
117	Adams	Benevolent & Protective Order Of Elks Of The Usa	Fraternal Beneficiary Society, O	PO Box 4103	Gettysburg	PA	17325-4103	Gettysburg Borough	Urban
118	Adams	Berdan Sharpshooters Preservation Association Inc	Charitable Organization	529 McLaughlin Rd	Gettysburg	PA	17325-7158	Gettysburg Borough	Urban
119	Adams	Bermudian Bible Church	Religious Organization	Locust Street	East Berlin	PA	17316-0000	East Berlin Borough	Rural
120	Adams	Bermudian Freedom	Charitable Organization	12 Thomas Dr	East Berlin	PA	17316-9360	East Berlin Borough	Rural
121	Adams	Bermudian Sports Club	Educational Organization	PO Box 88	East Berlin	PA	17316-0088	East Berlin Borough	Rural
122	Adams	Bermudian Springs Elementary School Parent Teachers Organiz	Educational Organization; Char	PO Box 250	York Springs	PA	17372-0250	York Springs Borough	Rural
123	Adams	Bermudian Springs Middle School Parent Teacher Organization	Charitable Organization	7335 Carlisle Pike	York Springs	PA	17372-8807	York Springs Borough	Rural
124	Adams	Bethel Assembly Of God Church	Religious Organization	1125 Frederick Pike	Littlestown	PA	17340-9385	Littlestown Borough	Urban
125	Adams	Bethel Joseph Spiritual Center	Religious Organization	6 Forest Trl	Fairfield	PA	17320-8148	Fairfield Borough	Rural
126	Adams	Bethlehem Lutheran Church	Religious Organization	PO Box 449	Bendersville	PA	17306-0449	Bendersville Borough	Rural
127	Adams	Betty J Riggeal Test Tr	4947(a)(1) - Private Foundation	PO Box 4566	Gettysburg	PA	17325-4566	Gettysburg Borough	Urban
128	Adams	Biglerville High School Band Boosters Association	Charitable Organization; Educa	16 N Main St	Biglerville	PA	17307-0000	Biglerville Borough	Rural
129	Adams	Biglerville Historical And Preservation Society	Charitable Organization; Educa	154 W Hanover St	Biglerville	PA	17307-0000	Biglerville Borough	Rural
130	Adams	Biglerville Hose & Truck Co	Charitable Organization; Organ	PO Box 391	Biglerville	PA	17307-0391	Biglerville Borough	Rural
131	Adams	Biglerville Hose & Truck Volunteer Firemens Relief Associatio	Social Welfare Organization	PO Box 391	Biglerville	PA	17307-0391	Biglerville Borough	Rural
132	Adams	Bishop-Noel-Reinicker Memorial Perpetual Charitable Tr Ua	4947(a)(1) - Private Foundation	PO Box 4566	Gettysburg	PA	17325-4566	Gettysburg Borough	Urban
133	Adams	Blue Knights Motorcycle Club	Domestic Fraternal Societies a	PO Box 3261	Gettysburg	PA	17325-0261	Gettysburg Borough	Urban
134	Adams	Blue Lotus Buddhist Temple-Pennsylvania	Religious Organization	654 Yingling Rd	Littlestown	PA	17340-9732	Littlestown Borough	Urban
135	Adams	Blue Ridge Sportsmens Assoc Inc	Pleasure, Recreational, or Soci	3030 Waynesboro Pike	Fairfield	PA	17320-9801	Fairfield Borough	Rural
136	Adams	Bonneauville Community Fire Company Inc	Social Welfare Organization	10 Elm Ave	Gettysburg	PA	17325-7807	Gettysburg Borough	Urban
137	Adams	Brethren Home Community	Charitable Organization; Religi	2990 Carlisle Pike	New Oxford	PA	17350-9582	New Oxford Borough	Urban
138	Adams	Brethren Home Foundation	Charitable Organization	2990 Carlisle Pike	New Oxford	PA	17350-9582	New Oxford Borough	Urban
139	Adams	Brushdown Bombers	Charitable Organization; Educa	15 Franklin Dr	Mc Sherrystown	PA	17344-1132	McSherrystown Borough	Urban
140	Adams	Brushdown Bombers	Charitable Organization; Educa	15 Franklin Dr	Mc Sherrystown	PA	17344-1132	McSherrystown Borough	Urban

Ready Accessibility: Investigate 80%

# Survey Dissemination and Analysis of Data

## Desktop

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Section 1. Analysis of Internal versus external IT services and resources

Q1  
How many in-house IT personnel does your organization employ?

None  
 1  
 2  
 3  
 Other

Q2: Does your organization outsource anything related to information technology (IT)?

Yes  
 No  
 Not sure



## Mobile

12:29

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Section 1. Analysis of Internal versus external IT services and resources

Q1  
How many in-house IT personnel does your organization employ?

None  
 1  
 2  
 3  
 Other

Q2: Does your organization outsource anything related to information technology (IT)?

Yes  
 No  
 Not sure

# Example of Survey Coverage

Category	Questions	Goals
1) Internal vs. External IT services and resources	Are IT services and resources managed internally or by a third-party?	Helps us assess challenges of maintaining adequate support to secure organization
2) Website security	Determine existence of website and how it is being used to conduct nonprofit-related interaction with public	Determine whether right level of support is involved in hardening site and related host technology
3) IT and Security budgeting	Determine percentage of operating budget that goes toward IT and what percentage of that goes toward securing organization's assets	Compare spend between FPOs and NPOs and determine whether there is correlation between under-funding and threat risk
4) Current risk environment	Determine NPOs confidence in their cybersecurity measures to protect them against an attack/breach	Determine which NPOs are more prepared to handle disruptions resulting from cyber incident

# Example of Survey Coverage

Category	Questions	Goals
5) Business continuity/disaster recovery plan	Determine whether NPO has a plan for sustaining operations outside of their primary work location	Helps us determine how well prepared each rural non-profit is able to recover from a major disaster or a cyberattack
6) Physical security	Assess what measures have been taken to secure the physical facilities	Look for any gaps in any controls that expose vulnerabilities that need to be addressed
7) Logical access control	Determine how rural non-profits have implemented authentication and authorization within the organization	Looking for gaps in controls placed on application systems and data regularly accessed by employees, whether two-factor authentication is used, and existence of bring-your-own-device (BYOD) policy
8) Inventory	Determine whether an up-to-date record of IT assets exists	Identify whether assets are active/inactive, IT audit frequency, and acceptable use policy enforcement

# Continuing Work and Conclusions

- Our continuing work will deliver specific strategies, techniques, and procedures that non-profits can use to strengthen their cyber posture within their limited resource constraints
- Our preliminary best practices focus on best practices for small businesses including sound cyber hygiene practices, educating employees, and preparing for incident response that we will further tailor for non-profits after completing our data analysis phase
- We also seek consideration for our paper to be reviewed and published in the Kennesaw Journal of Undergraduate Research



# Acknowledgements

## Commonwealth Campus Center Nodes (C3N)

- Build collaboration between University Park-based research centers and Commonwealth Campus faculty nodes
- Hubs for conducting cutting-edge research in a given technical area, resulting in high-impact journal publications and multi-million-dollar external funding

## Center for Cyber-Security, Information Privacy, and Trust

- Detect and remove threats of information misuse to the human society: mitigate risk, reduce uncertainty, and enhance predictability and trust.
- Produce leading scholars in interdisciplinary cyber-security research.
- Become a national leader in information assurance education

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Questions?

**Thank you for the opportunity to  
present our paper!**



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