

# Protecting Information Assets

## - Unit# 5 -

### Creating a Security Aware Organization

# Agenda

- In The News
- Awareness and Training InfoSec Controls
- Creating a Security Aware Organization
  - Control inventory baselines
  - The Threat landscape
  - Employee risk
  - Training course content (examples)
- Test Taking Tip
- Quiz

# Updated Schedule in Syllabus

MIS5206 Section 001

Syllabus

Page :

## Schedule:

Unit	Assignment Topics	Date
1	Introduction to MIS5206	Aug. 26
	Understanding an Organization's Risk Environment	
2	Case Study 1: <i>Snowfall and a stolen laptop</i>	Sept. 2
	Data Classification Process and Models	
3	Risk Evaluation	Sept. 9
	<i>Class will not be held on September 16<sup>th</sup></i>	<i>Sept. 16</i>
4	Case Study 2: <i>Autopsy of a Data Breach: The Target Case</i>	Sept. 23
5	Creating a Security Aware Organization	Sept. 30
6	Physical and Environmental Security	Oct. 7
7	<b>Midterm Exam</b>	Oct. 8-10
8	Case Study 3: <i>A Hospital Catches the "Millennium Bug"</i>	Oct. 14
9	Business Continuity and Disaster Recovery Planning	Oct. 21
10	Network Security	Oct. 28
11	Cryptography, Public Key Encryption and Digital Signatures	Nov. 4
12	Identity Management and Access Control	Nov.11
13	Computer Application Security	Nov. 18
	Team Project Presentations	
14	Review	Dec.2
	Team Project Presentations	
15	<b>Final Exam</b>	Dec. 9

# In The News

**Yangyuan Lin says**

SEPTEMBER 28, 2021 AT 1:51 PM

(Edit)

This article is about social media scam, which is called Twitter bots are tricking users into making PayPal and Venmo payments into fraudsters' accounts.

Bots will search for "PayPal", "Venmo" and other keywords to find tweets, and obtain the personal information of legitimate users to pretend to be legitimate users. Then Bots would block the account it imitated, and in their case copied the entire configuration file and added an underscore to the end of the name. (For example, the legal user's name is "Lin", but the name impersonated by Bots will be "Lin\_")

The bot will use similar usernames to pretend to be other users and provide false payment information to the original Twitter user to obtain payment. Bots usually don't delete posts, but often change names. These fake accounts are hard to find, and they even have fans.

(Personal experience: I was scammed once on Facebook, it was not a bot but a person. He changed the lowercase L(l) to the uppercase i(I) to imitate legitimate users.)

# In The News

**Shubham Patil says**

SEPTEMBER 28, 2021 AT 4:16 PM

(Edit)

The National Institute of Standards and Technology plans to publish various volumes of its forthcoming Cybersecurity Practice Guide throughout 2022 and beyond.

Zero Trust Network Architecture:

Zero Trust is a security framework requiring all users, whether in or outside the organization's network, to be authenticated, authorized, and continuously validated for security configuration and posture before being granted or keeping access to applications and data.

Link: <https://www.fedscoop.com/nist-cybersecurity-practice-guide-2022/>

# In The News

**Elizabeth Gutierrez says**

SEPTEMBER 28, 2021 AT 7:25 PM

(Edit)

I obtained the article, "Awareness of cyberattacks and cybersecurity may be lacking among workers" by TechRepublic. A survey administered by Armis to business professionals discovered the lack of knowledge about recent incidents and proper cyber hygiene. The respondents were from a variety of different professional backgrounds such as education, finance, healthcare, IT & telecom, manufacturing, sales, media and marketing. Twenty-one percent of the respondents had not heard about the attack against Colonial Pipeline and forty-five percent of the respondents were unaware of the hack against the Florida water treatment plant; some of those that were familiar with the attacks did not see a lasting impact. Now that businesses are starting to open up again, many employees are moving to a hybrid model of working both at home and in the office. Despite the possible risks, more than half of the respondents said they do not believe their personal devices pose any threat to their organization, whereas twenty-seven percent admitted that their companies don't have any existing policies to secure both work and personal devices. The article pointed out that "a lack of awareness turns an employee into an easy target for a cybercriminal looking to access an organization's network via a phishing attack or social engineering". Therefore, organizations can reduce the possibilities or success of an attack by normalizing a security awareness culture. At every level, employees should be taught how to identify malware-laced emails and other invasive attempts at credential theft so that they do not become easy targets for cybercriminals.

Link to article: <https://www.techrepublic.com/article/awareness-of-cyberattacks-and-cybersecurity-may-be-lacking-among-workers/>

# Where would you look to learn about cybersecurity awareness and training controls?

# Where would you look to learn about cybersecurity awareness and training controls?

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
SC-25	Thin Nodes	P0	Not Selected	Not Selected	Not Selected
SC-26	Honeypots	P0	Not Selected	Not Selected	Not Selected
SC-27	Platform-Independent Applications	P0	Not Selected	Not Selected	Not Selected
SC-28	Protection of Information at Rest	P1	Not Selected	SC-28	SC-28

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
SA-10	Developer Configuration Management	P1	Not Selected	SA-10	SA-10
SA-11	Developer Security Testing and Evaluation	P1	Not Selected	SA-11	SA-11
SA-12	Supply Chain Protection	P1	Not Selected	Not Selected	SA-12
SA-13	Trustworthiness	P0	Not Selected	Not Selected	Not Selected

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
PE-17	Alternate Work Site	P2	Not Selected	PE-17	PE-17
PE-18	Location of Information System Components	P3	Not Selected	Not Selected	PE-18
PE-19	Information Leakage	P0	Not Selected	Not Selected	Not Selected
PE-20	Asset Monitoring and Tracking	P0	Not Selected	Not Selected	Not Selected

TABLE 1: SECURITY AND PRIVACY CONTROL FAMILIES

ID	FAMILY	ID	FAMILY
<a href="#">AC</a>	Access Control	<a href="#">PE</a>	Physical and Environmental Protection
<a href="#">AT</a>	Awareness and Training	<a href="#">PL</a>	Planning
<a href="#">AU</a>	Audit and Accountability	<a href="#">PM</a>	Program Management
<a href="#">CA</a>	Assessment, Authorization, and Monitoring	<a href="#">PS</a>	Personnel Security
<a href="#">CM</a>	Configuration Management	<a href="#">PT</a>	PII Processing and Transparency
<a href="#">CP</a>	Contingency Planning	<a href="#">RA</a>	Risk Assessment
<a href="#">IA</a>	Identification and Authentication	<a href="#">SA</a>	System and Services Acquisition
<a href="#">IR</a>	Incident Response	<a href="#">SC</a>	System and Communications Protection
<a href="#">MA</a>	Maintenance	<a href="#">SI</a>	System and Information Integrity
<a href="#">MP</a>	Media Protection	<a href="#">SR</a>	Supply Chain Risk Management


NIST Special Publication 800-53  
Revision 5

Security and Privacy Controls for  
Information Systems and Organizations

JOINT TASK FORCE

This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-53r5>

September 2020  
INCLUDES UPDATES AS OF 12-10-2020; SEE PAGE XVII



U.S. Department of Commerce  
Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology  
Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

AC-11	Session Lock	P3	Not Selected	AC-11 (1)	AC-11 (1)	d	Not Selected	1 (2) (3)	IA-5 (1) (2) (3) (1)	1	PE-14 (1)
AC-12	Session Termination	P2	Not Selected	AC-12	AC-12		CA-1	-5	IA-6	1	PE-15 (1)
AC-13	Withdrawn	---	---	---	---		CA-2 (1) (2)	-7	IA-7	1	PE-16
AC-14	Permitted Actions without Identification or Authentication	P3	AC-14	AC-14	AC-14		CA-3 (5)	1 (2) (3) (4)	IA-8 (1) (2) (3) (4)	1	
AC-15	Withdrawn	---	---	---	---		---	lected	Not Selected		
AC-16	Security Attributes	P0	Not Selected	Not Selected	Not Selected		CA-5	lected	Not Selected		
AC-17	Remote Access	P1	AC-17	AC-17 (1) (2) (3) (4)	AC-17 (1) (2) (3) (4)		CA-6	lected	Not Selected		
AC-18	Wireless Access	P1	AC-18	AC-18 (1)	AC-18 (1) (4) (5)		CA-7 (1)				
AC-19	Access Control for Mobile Devices	P1	AC-19	AC-19 (5)	AC-19 (5)	d	CA-8	-1	IR-1		
AC-20	Use of External Information Systems	P1	AC-20	AC-20 (1) (2)	AC-20 (1) (2)		CA-9	-2	IR-2 (1) (2)		
AC-21	Information Sharing	P2	Not Selected	AC-21	AC-21		CM-1				
AC-22	Publicly Accessible Content	P3	AC-22	AC-22	AC-22		CM-2 (1) (2) (3) (7)				
AC-23	Data Mining Protection	P0	Not Selected	Not Selected	Not Selected	(7)	CM-3 (1) (2)				
AC-24	Access Control Decisions	P0	Not Selected	Not Selected	Not Selected		CM-4 (1)				
AC-25	Reference Monitor	P0	Not Selected	Not Selected	Not Selected		CM-5 (1) (2) (3)				



## Control Baselines for Information Systems and Organizations

JOINT TASK FORCE

This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-53B>

October 2020

INCLUDES UPDATES AS OF 12-10-2020; SEE PAGE XI



U.S. Department of Commerce  
 Wilbur L. Ross, Jr., Secretary

National Institute of Standards and Technology  
 Walter Copan, NIST Director and Under Secretary of Commerce for Standards and Technology

TABLE 3-2: AWARENESS AND TRAINING FAMILY

CONTROL NUMBER	CONTROL NAME CONTROL ENHANCEMENT NAME	PRIVACY CONTROL BASELINE	SECURITY CONTROL BASELINES		
			LOW	MOD	HIGH
<b>AT-1</b>	<b>Policy and Procedures</b>	X	X	X	X
<b>AT-2</b>	<b>Literacy Training and Awareness</b>	X	X	X	X
AT-2(1)	PRACTICAL EXERCISES				
AT-2(2)	INSIDER THREAT		X	X	X
AT-2(3)	SOCIAL ENGINEERING AND MINING			X	X
AT-2(4)	SUSPICIOUS COMMUNICATIONS AND ANOMALOUS SYSTEM BEHAVIOR				
AT-2(5)	ADVANCED PERSISTENT THREAT				
AT-2(6)	CYBER THREAT ENVIRONMENT				
<b>AT-3</b>	<b>Role-Based Training</b>	X	X	X	X
AT-3(1)	ENVIRONMENTAL CONTROLS				
AT-3(2)	PHYSICAL SECURITY CONTROLS				
AT-3(3)	PRACTICAL EXERCISES				
AT-3(4)	SUSPICIOUS COMMUNICATIONS AND ANOMALOUS SYSTEM BEHAVIOR	W: Incorporated into AT-2(4).			
AT-3(5)	PROCESSING PERSONALLY IDENTIFIABLE INFORMATION	X			
<b>AT-4</b>	<b>Training Records</b>	X	X	X	X
AT-5	Contacts with Security Groups and Associations	W: Incorporated into PM-15.			
<b>AT-6</b>	<b>Training Feedback</b>				

CONTROL NUMBER	CONTROL NAME CONTROL ENHANCEMENT NAME	PRIVACY CONTROL BASELINE	SECURITY CONTROL BASELINES		
			LOW	MOD	HIGH
AT-1	Policy and Procedures	X	X	X	X
AT-2	Literacy Training and Awareness	X	X	X	X
AT-2(1)	PRACTICAL EXERCISES				
AT-2(2)	INSIDER THREAT		X	X	X
AT-2(3)	SOCIAL ENGINEERING AND MINING			X	X
AT-2(4)	SUSPICIOUS COMMUNICATIONS AND ANOMALOUS SYSTEM BEHAVIOR				
AT-2(5)	ADVANCED PERSISTENT THREAT				
AT-2(6)	CYBER THREAT ENVIRONMENT				
AT-3	Role-Based Training	X	X	X	X
AT-3(1)	ENVIRONMENTAL CONTROLS				
AT-3(2)	PHYSICAL SECURITY CONTROLS				
AT-3(3)	PRACTICAL EXERCISES				
AT-3(4)	SUSPICIOUS COMMUNICATIONS AND ANOMALOUS SYSTEM BEHAVIOR	W: Incorporated into AT-2(4).			
AT-3(5)	PROCESSING PERSONALLY IDENTIFIABLE INFORMATION	X			
AT-4	Training Records	X	X	X	X

***How would you audit these risk controls?***

DRAFT NIST Special Publication 800-53A  
Revision 5

## Assessing Security and Privacy Controls in Information Systems and Organizations

JOINT TASK FORCE

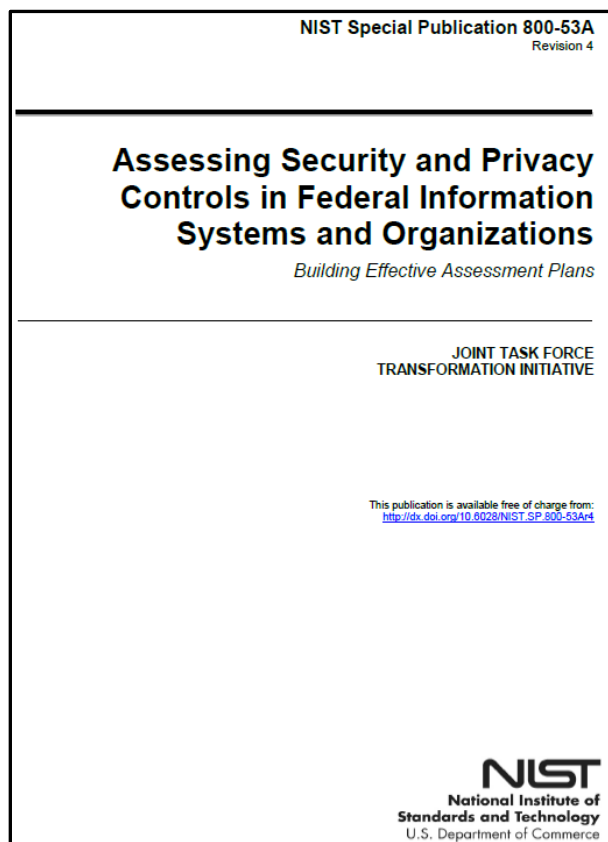
This publication is available free of charge from:  
<https://doi.org/10.6028/NIST.SP.800-53Ar5-draft>

August 2021



U.S. Department of Commerce  
Gina M. Raimondo, Secretary

National Institute of Standards and Technology  
James K. Olthoff, Performing the Non-Exclusive Functions and Duties of the Under Secretary of Commerce  
for Standards and Technology & Director, National Institute of Standards and Technology

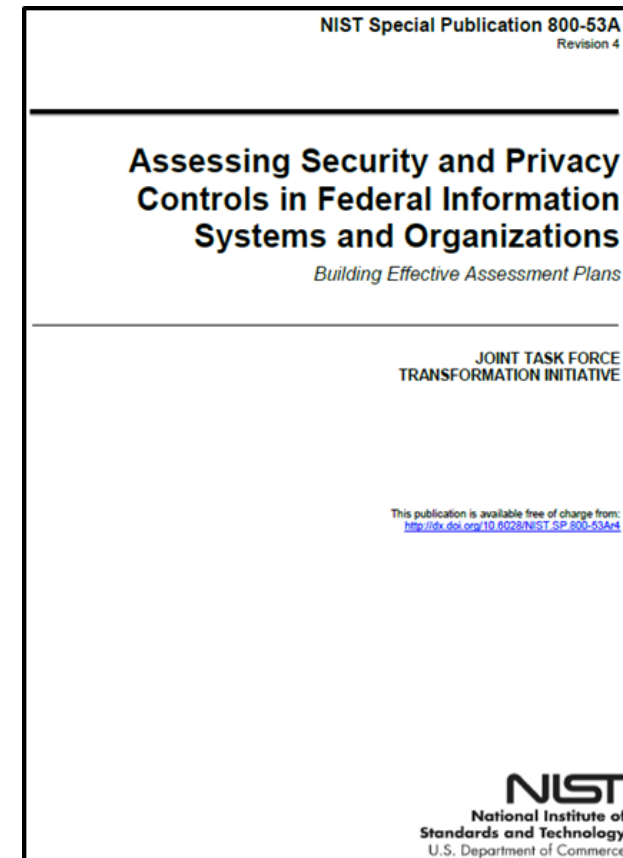


AT-1	SECURITY AWARENESS AND TRAINING POLICY AND PROCEDURES		
<b>ASSESSMENT OBJECTIVE:</b> <i>Determine if the organization:</i>			
AT-1(a)(1)	AT-1(a)(1)[1]	<i>develops and documents an security awareness and training policy that addresses:</i>	
		AT-1(a)(1)[1][a]	<i>purpose;</i>
		AT-1(a)(1)[1][b]	<i>scope;</i>
		AT-1(a)(1)[1][c]	<i>roles;</i>
		AT-1(a)(1)[1][d]	<i>responsibilities;</i>
		AT-1(a)(1)[1][e]	<i>management commitment;</i>
		AT-1(a)(1)[1][f]	<i>coordination among organizational entities;</i>
		AT-1(a)(1)[1][g]	<i>compliance;</i>
	AT-1(a)(1)[2]	<i>defines personnel or roles to whom the security awareness and training policy are to be disseminated;</i>	
	AT-1(a)(1)[3]	<i>disseminates the security awareness and training policy to organization-defined personnel or roles;</i>	
AT-1(a)(2)	AT-1(a)(2)[1]	<i>develops and documents procedures to facilitate the implementation of the security awareness and training policy and associated awareness and training controls;</i>	
	AT-1(a)(2)[2]	<i>defines personnel or roles to whom the procedures are to be disseminated;</i>	
	AT-1(a)(2)[3]	<i>disseminates the procedures to organization-defined personnel or roles;</i>	
AT-1(b)(1)	AT-1(b)(1)[1]	<i>defines the frequency to review and update the current security awareness and training policy;</i>	
	AT-1(b)(1)[2]	<i>reviews and updates the current security awareness and training policy with the organization-defined frequency;</i>	
AT-1(b)(2)	AT-1(b)(2)[1]	<i>defines the frequency to review and update the current security awareness and training procedures; and</i>	
	AT-1(b)(2)[2]	<i>reviews and updates the current security awareness and training procedures with the organization-defined frequency.</i>	
<b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b> Examine: [SELECT FROM: Security awareness and training policy and procedures; other relevant documents or records]. Interview: [SELECT FROM: Organizational personnel with security awareness and training responsibilities; organizational personnel with information security responsibilities].			

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
Awareness and Training					
AT-1	Security Awareness and Training Policy and Procedures	P1	AT-1	AT-1	AT-1
AT-2	Security Awareness Training	P1	AT-2	AT-2 (2)	AT-2 (2)
AT-3	Role-Based Security Training	P1	AT-3	AT-3	AT-3
AT-4	Security Training Records	P3	AT-4	AT-4	AT-4



*How would you assess the existence and strength of the AT-2 control ?*

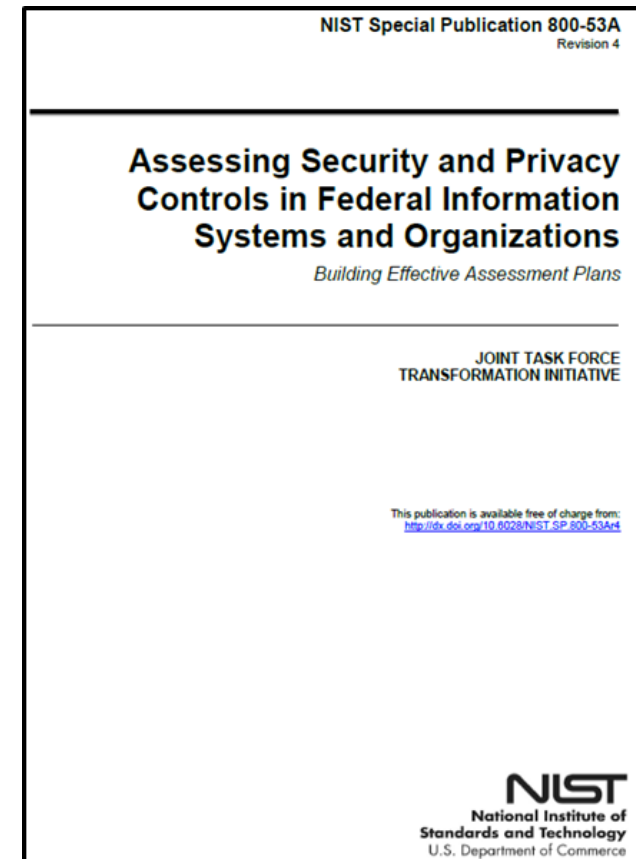


...answer:

AT-2		SECURITY AWARENESS TRAINING	
<b>ASSESSMENT OBJECTIVE:</b> <i>Determine if the organization:</i>			
AT-2(a)		<i>provides basic security awareness training to information system users (including managers, senior executives, and contractors) as part of initial training for new users;</i>	
AT-2(b)		<i>provides basic security awareness training to information system users (including managers, senior executives, and contractors) when required by information system changes; and</i>	
AT-2(c)		AT-2(c)[1]	<i>defines the frequency to provide refresher security awareness training thereafter to information system users (including managers, senior executives, and contractors); and</i>
		AT-2(c)[2]	<i>provides refresher security awareness training to information users (including managers, senior executives, and contractors) with the organization-defined frequency.</i>
<b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b>  Examine: [SELECT FROM: Security awareness and training policy; procedures addressing security awareness training implementation; appropriate codes of federal regulations; security awareness training curriculum; security awareness training materials; security plan; training records; other relevant documents or records].  Interview: [SELECT FROM: Organizational personnel with responsibilities for security awareness training; organizational personnel with information security responsibilities; organizational personnel comprising the general information system user community].  Test: [SELECT FROM: Automated mechanisms managing security awareness training].			

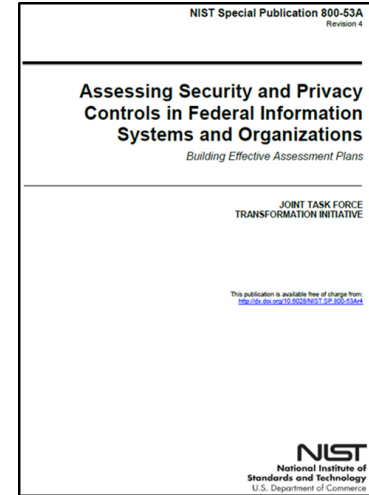
CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
Awareness and Training					
AT-1	Security Awareness and Training Policy and Procedures	P1	AT-1	AT-1	AT-1
AT-2	Security Awareness Training	P1	AT-2	AT-2 (2)	AT-2 (2)
AT-3	Role-Based Security Training	P1	AT-3	AT-3	AT-3
AT-4	Security Training Records	P3	AT-4	AT-4	AT-4

*How would you assess the existence and strength of the AT-2 (2) control ?*



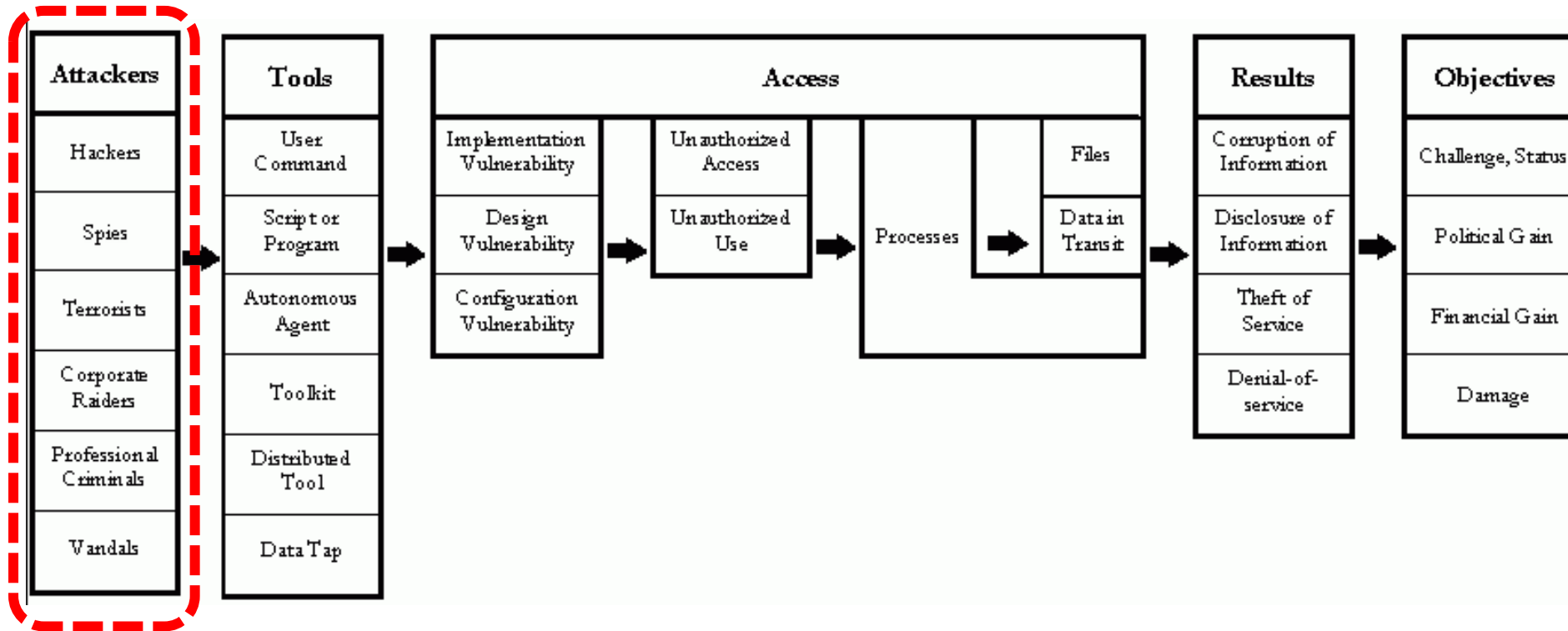
...answer:

AT-2(2)	SECURITY AWARENESS TRAINING   <i>INSIDER THREAT</i>
	<b>ASSESSMENT OBJECTIVE:</b> <i>Determine if the organization includes security awareness training on recognizing and reporting potential indicators of insider threat.</i>
	<b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b> <b>Examine:</b> [SELECT FROM: Security awareness and training policy; procedures addressing security awareness training implementation; security awareness training curriculum; security awareness training materials; security plan; other relevant documents or records]. <b>Interview:</b> [SELECT FROM: Organizational personnel that participate in security awareness training; organizational personnel with responsibilities for basic security awareness training; organizational personnel with information security responsibilities].



# What is in this picture ?

## What is missing from this diagram?



*Howard's process-based taxonomy, from Hansman, S. and Hunt, R., 2004, "A taxonomy of network and computer attacks", Computers & Security, page 3, Elsevier Ltd. Cited from Howard, JD, 1997, "An analysis of security incidents on the internet 1989-1995. PhD thesis, Carnegie Mellon University.*



# The threat landscape....

*What is the role of humans in a breach of information security?*

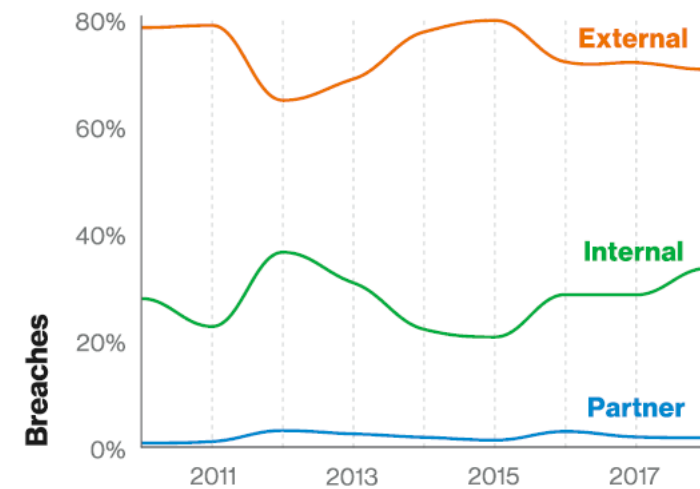
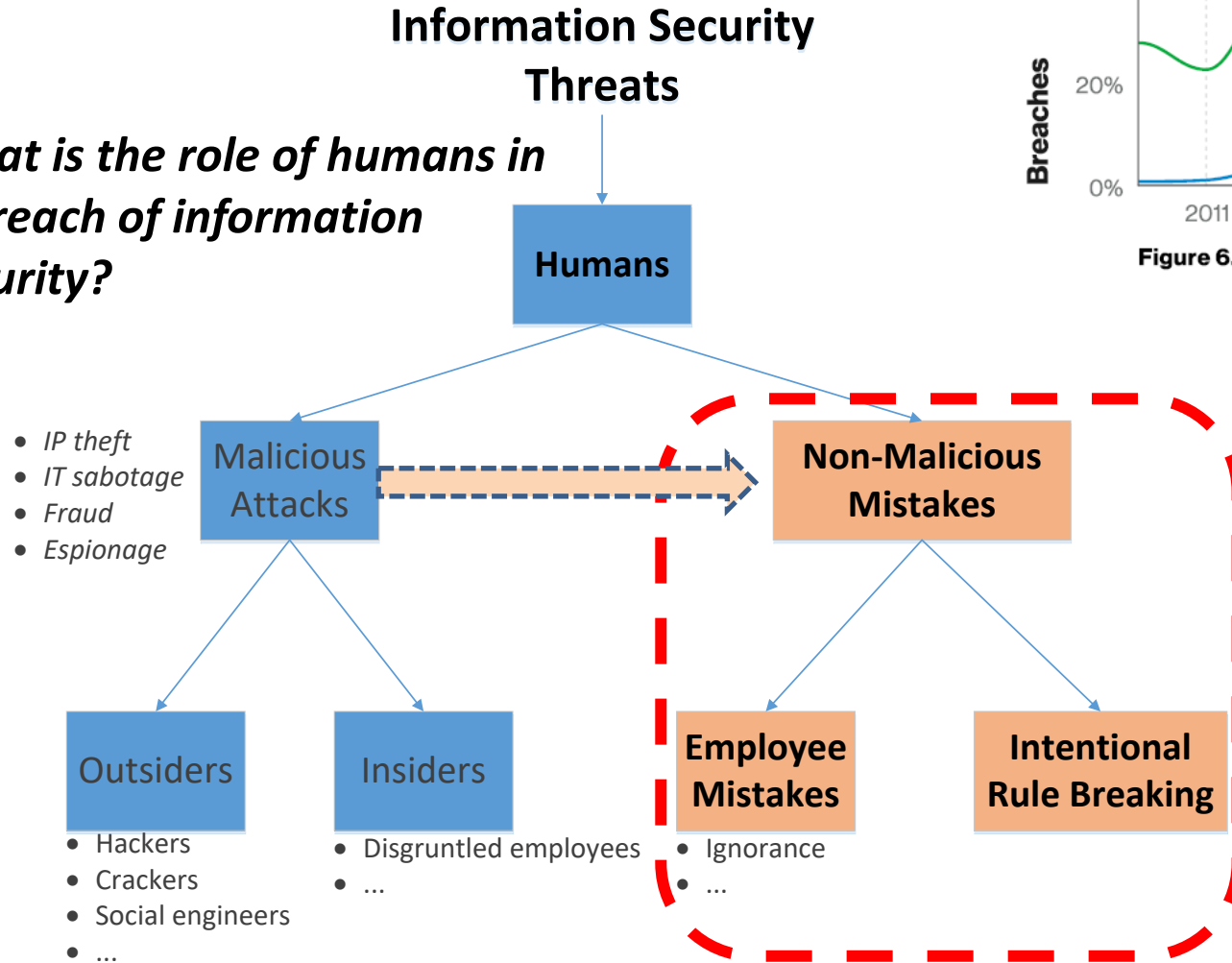
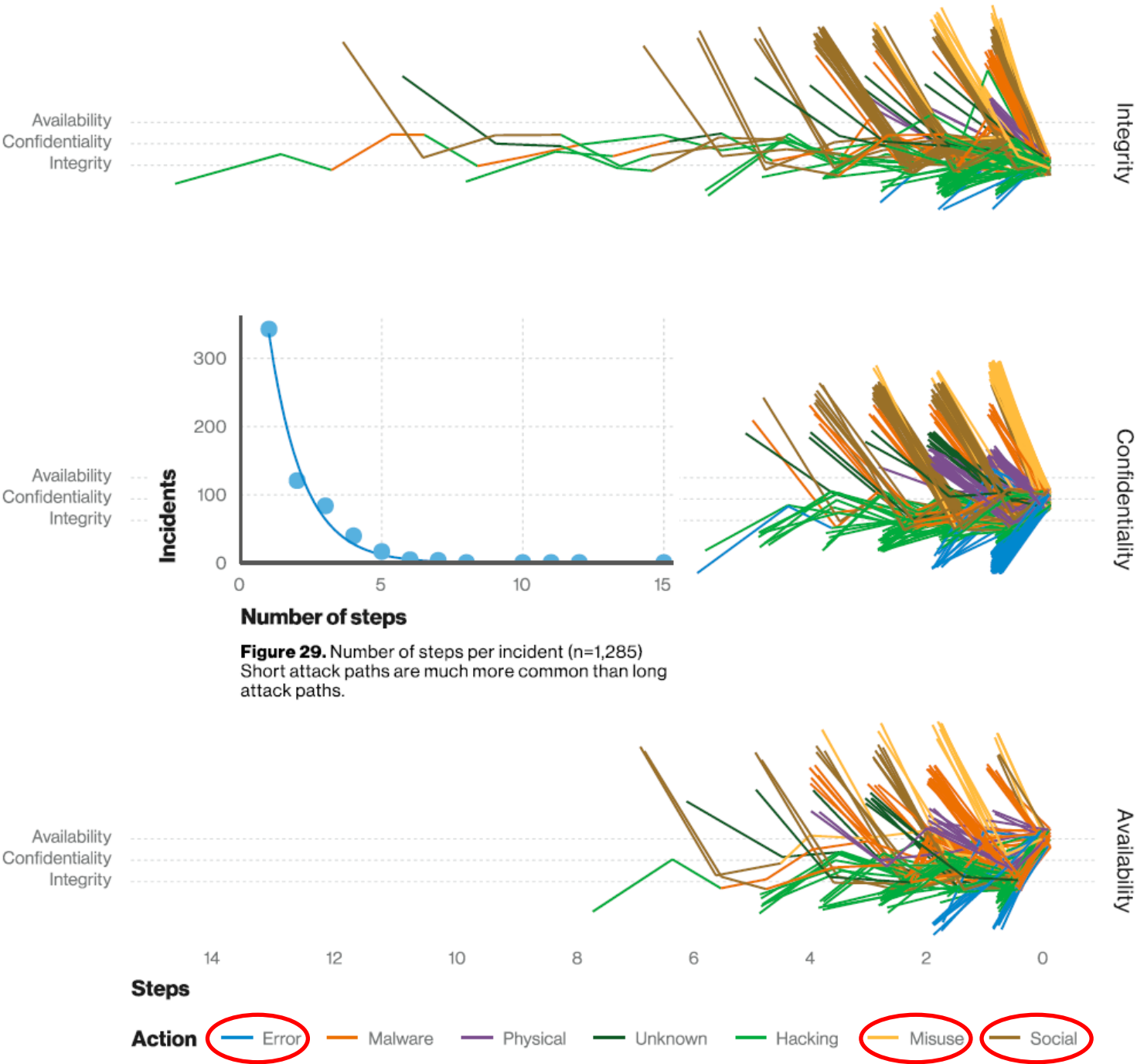


Figure 6. Threat actors in breaches over time



# What roles do employees play in these attack chains



Top Threats 2019-2020		Assessed Trends	Change in Ranking
1	Malware <a href="#">↗</a>	---	---
2	Web-based Attacks <a href="#">↗</a>	---	↗
3	Phishing <a href="#">↗</a>	↗	↗
4	Web application attacks <a href="#">↗</a>	---	↘
5	Spam <a href="#">↗</a>	↘	↗
6	Denial of service <a href="#">↗</a>	↘	↘
7	Identity theft <a href="#">↗</a>	↗	↗
8	Data breaches <a href="#">↗</a>	---	---
9	Insider threat <a href="#">↗</a>	↗	---
10	Botnets <a href="#">↗</a>	↘	↘
11	Physical manipulation, damage, theft and loss <a href="#">↗</a>	---	↘
12	Information leakage <a href="#">↗</a>	↗	↘
13	Ransomware <a href="#">↗</a>	↗	↗
14	Cyberespionage <a href="#">↗</a>	↘	↗
15	Cryptojacking <a href="#">↗</a>	↘	↘

**Legend:** Trends: ↘ Declining, --- Stable, ↗ Increasing    **Ranking:** ↗ Going up, --- Same, ↘ Going down



From January 2019 to April 2020

## The year in review

ENISA Threat Landscape

European Union Agency for Cybersecurity (ENISA)

*In which of these threats are humans the vulnerability?*

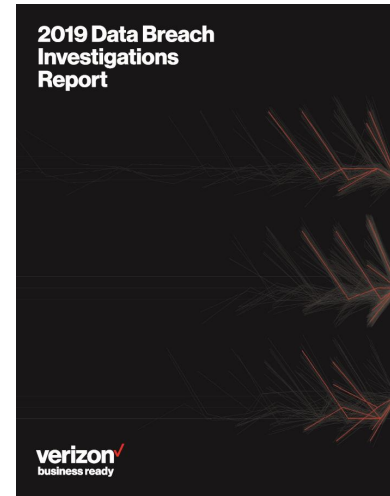
# Employee Risk

- [Ponemon Institute](#) (2018) surveyed 1,000 small and medium-sized business owners, found negligent employees or contractors caused 60% of the data breaches
  - Employee training and stringent security protocols are necessary to mitigate risk of malicious insiders, otherwise danger of data breach remains high
- [Ponemon survey](#) (2018) of 612 CISOs found that 70% consider the “lack of competent in-house staff” as their top concern in 2018

# Employee Risk

## ***Verizon 2019 Data Breach Investigation Report***

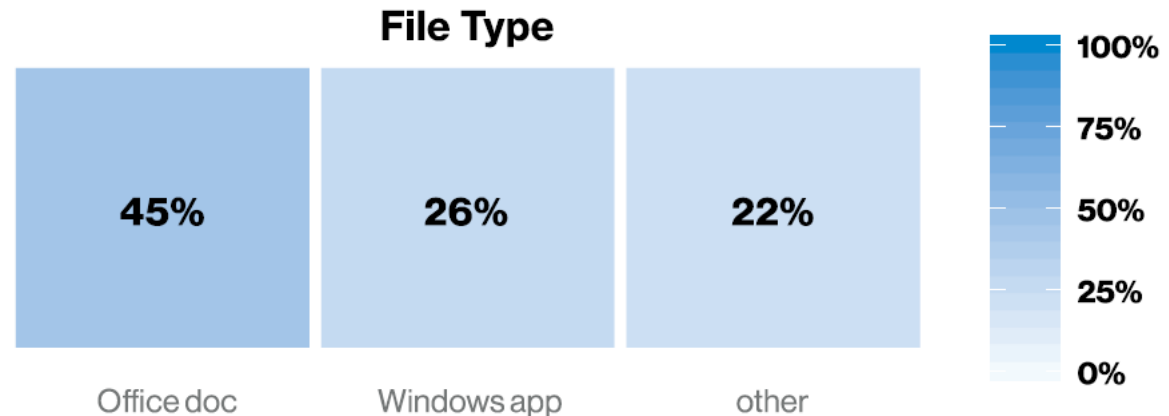
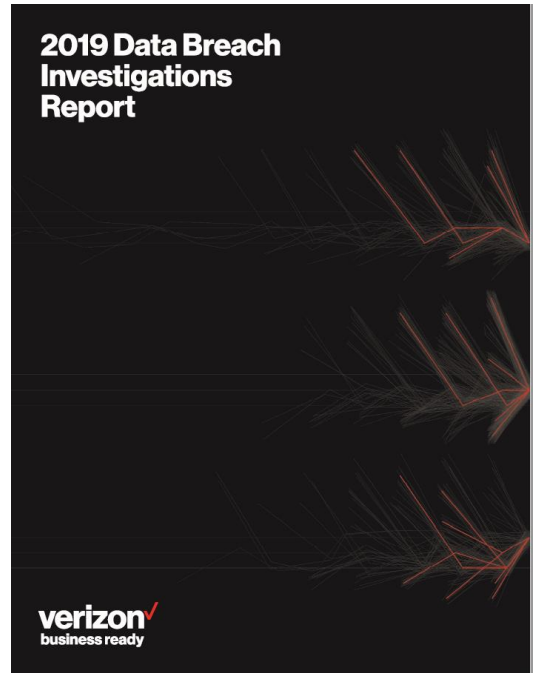
- 34% involved Internal actors
  - 32% involved Phishing
  - 21% caused by errors
  - 15% caused by misuse by authorized users
- 
- Firewall and email filters to weed out phishing emails and malicious websites are important, but they're not enough
  - Organizations must also ensure their security posture is good by:
    - Setting policies, educating staff, and enforcing good security hygiene
    - Taking advantage of the security options that are available
    - Training and testing employees
    - Implementing automated checks to ensure their security posture



# Employee Risk

## Malware delivery methods

- “When the method of malware installation was known, email was the most common, email was the most common point of entry.”
  - Median company received 94% of detected malware by email
- Once introduced by email, additional malware is downloaded, often encoded to bypass detection and installed directly



- 37% of breaches stole or used credentials
- Over 80% of breaches by hackers involve brute-force or use of lost or stolen credentials



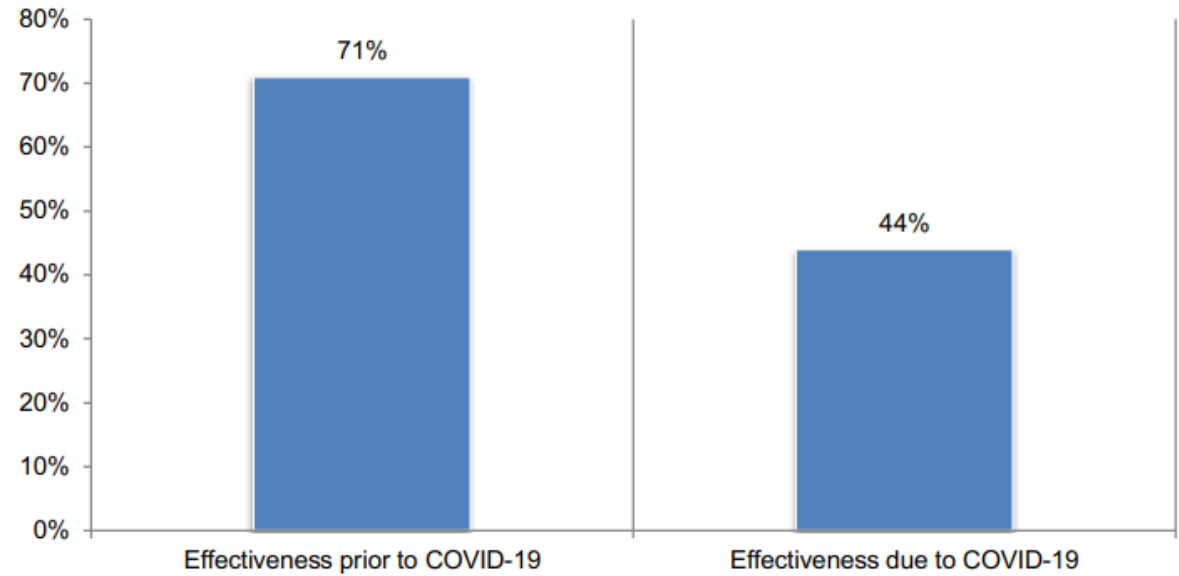
# Cybersecurity in the Remote Work Era:

## A Global Risk Report

Sponsored by Keeper Security, Inc.  
Independently conducted by Ponemon Institute LLC

**Figure 1. Effectiveness of organizations' IT security posture prior to COVID-19 and due to COVID-19**

1 = not effective to 10 = highly effective, 7+ responses presented





# Cybersecurity in the Remote Work Era:

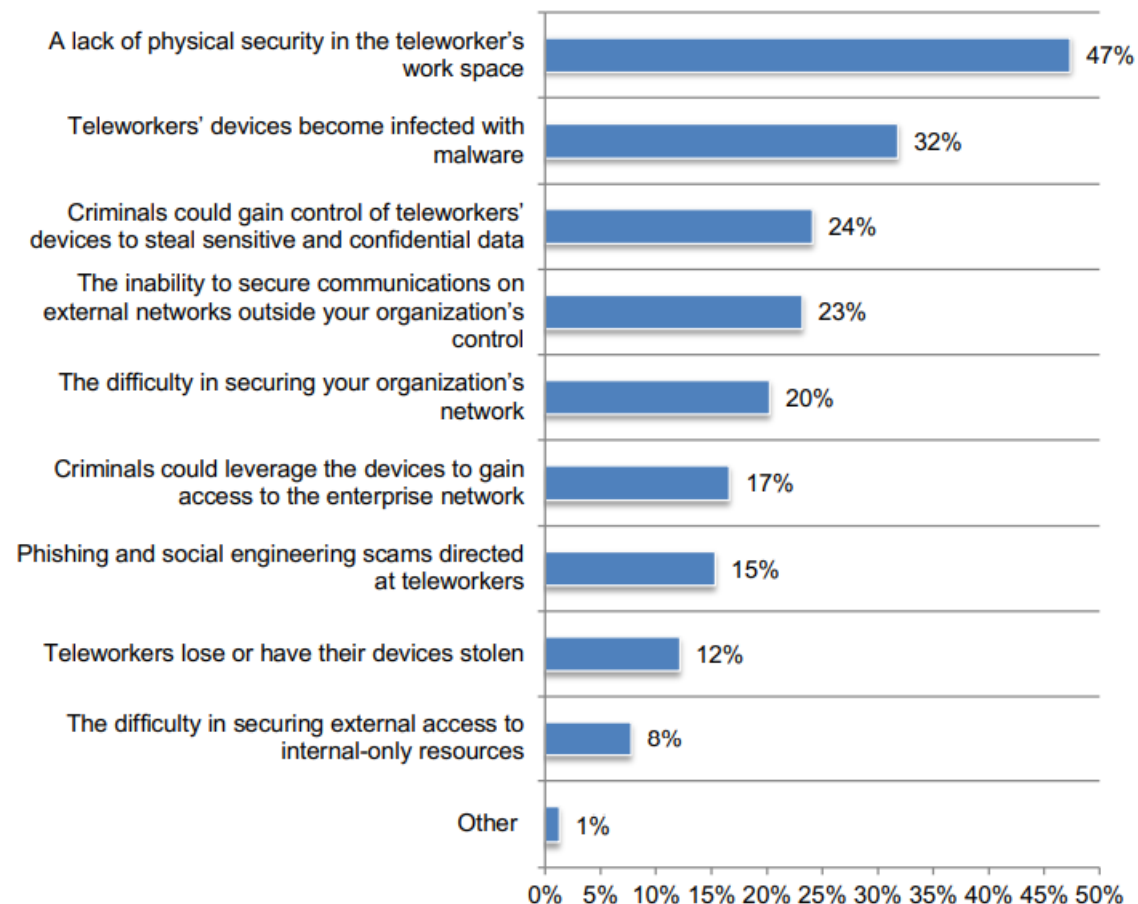
## A Global Risk Report

Sponsored by Keeper Security, Inc.  
Independently conducted by Ponemon Institute LLC



Ponemon Institute © 2020 Research Report

**Figure 3. Security risks organizations are most concerned about**  
More than one response permitted



## Cybersecurity in the Remote Work Era:

### A Global Risk Report

Sponsored by Keeper Security, Inc.

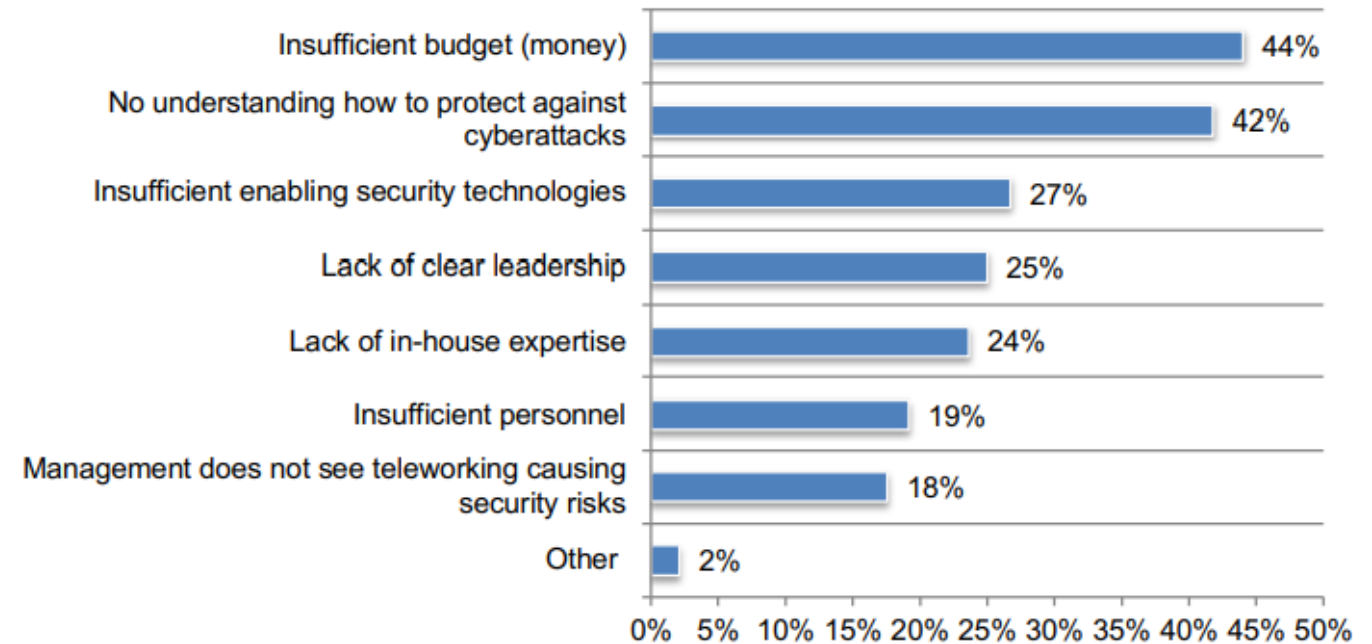
Independently conducted by Ponemon Institute LLC



Ponemon Institute © 2020 Research Report

**Figure 5. What challenges keep your organization's IT security posture from being fully effective due to teleworking?**

Two responses permitted



# Why is teaching security awareness essential ?

- We have a culture of trust that can be taken advantage of with dubious intent
- Most people feel security is not part of their job
- People underestimate the value of information
- Security technologies give people a false sense of protection from attack

# Non-malicious insider threat

1. A current or former employee, contractor, or business partner
2. Has or had authorized access to an organization's network, system, or data
3. Through action or inaction without malicious intent...  
*Causes harm or substantially increases the probability of future serious harm to...*  
***confidentiality, integrity, or availability** of the organization's information or information systems*

Major characteristic is '*failure in human performance*'

Carnegie Mellon University's Software Engineering Institute's  
(SEI) Computer Emergency Response Team (CERT) CERT  
Definition (2013)

# The Unintentional Insider threat

*from an ad for...*

3M™ ePrivacy Filter Software  
+ 3M™ Privacy Filter



# How would you characterize insiders' information security mistakes

- **Ignorant**
  - An unintentional accident
- **Negligent**
  - Willingly ignores policy to make things easier
- **Well meaning**
  - Prioritizes completing work and “getting ‘er done” takes over following policy

*Willis-Ford, C.D. (2015) “Education & Awareness: Manage the Insider Threat”, SRA International Inc., FISSA (Federal Information Systems Security Awareness) Working Group*

<http://csrc.nist.gov/organizations/fissea/2015-conference/presentations/march-24/fissea-2015-willis-ford.pdf>

# What are examples of insiders' accidents ?

- **Accidental Disclosure**
  - Posting sensitive data on public website
  - Sending sensitive data to wrong email address
- **Malicious Code**
  - Clicking on suspicious link in email
  - Using 'found' USB drive
- **Physical data release**
  - Losing paper records
- **Portable equipment**
  - Losing laptop, tablet
  - Losing portable storage device (USB drive, CD)

*Willis-Ford, C.D. (2015) "Education & Awareness: Manage the Insider Threat", SRA International Inc., FISSA (Federal Information Systems Security Awareness) Working Group*

<http://csrc.nist.gov/organizations/fissea/2015-conference/presentations/march-24/fissea-2015-willis-ford.pdf>

# Example of an accident made by a well-meaning employee...

## Utah Medicaid contractor loses job over data breach

By Kirsten Stewart The Salt Lake Tribune

Published January 17, 2013 5:26 pm

Health • Goold Health Systems CEO says mishap reinforces need to protect information.

### *“Terrific employee”:*

- Account Manager handling health data for Utah
- Employee had trouble uploading a file requested by State Health Dept.
- Copied 6,000 medical records to USB drive
- Lost the USB drive, and reported the issue
- CEO admits the employee probably didn’t even know she was breaking policy
  - this makes it accidental i.e. “well meaning...”

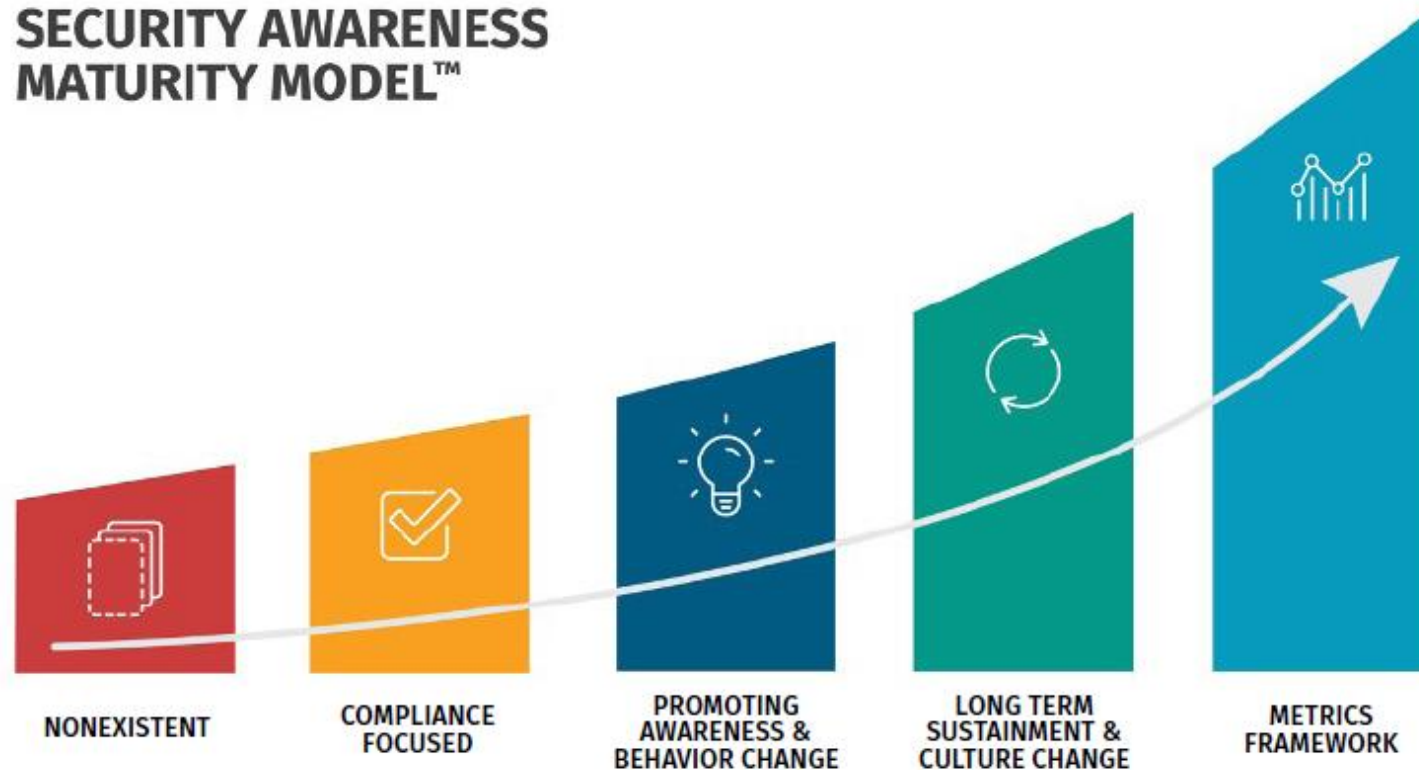


# Auditing a Security Awareness Training control

CNTL NO.	CONTROL NAME	PRIORITY	INITIAL CONTROL BASELINES		
			LOW	MOD	HIGH
Awareness and Training					
AT-1	Security Awareness and Training Policy and Procedures	P1	AT-1	AT-1	AT-1
AT-2	Security Awareness Training	P1	AT-2	AT-2 (2)	AT-2 (2)
AT-3	Role-Based Security Training	P1	AT-3	AT-3	AT-3
AT-4	Security Training Records	P3	AT-4	AT-4	AT-4

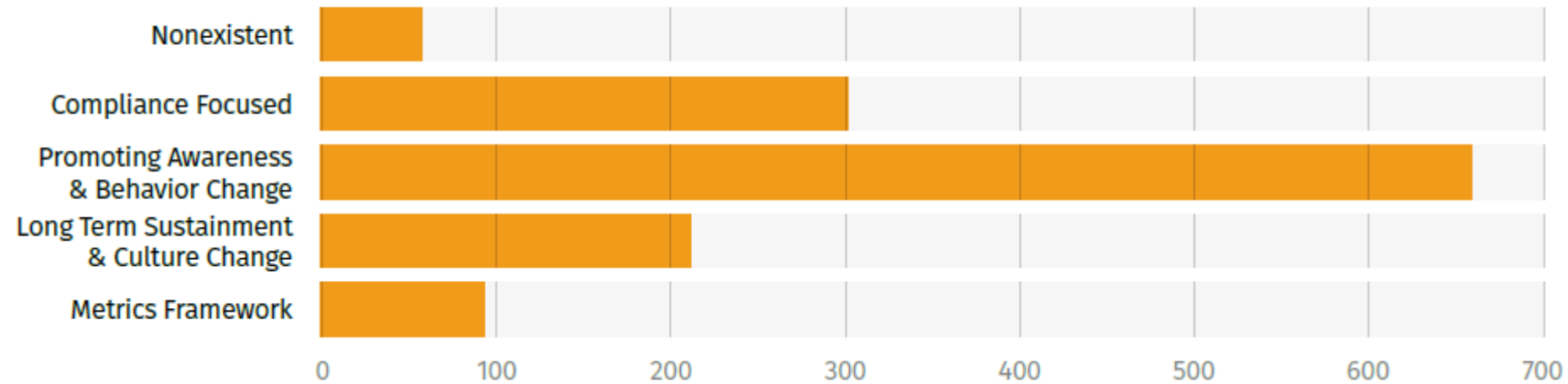
AT-2(2)	SECURITY AWARENESS TRAINING   <i>INSIDER THREAT</i>
	<b>ASSESSMENT OBJECTIVE:</b> <i>Determine if the organization includes security awareness training on recognizing and reporting potential indicators of insider threat.</i>
	<b>POTENTIAL ASSESSMENT METHODS AND OBJECTS:</b> <b>Examine:</b> [SELECT FROM: Security awareness and training policy; procedures addressing security awareness training implementation; security awareness training curriculum; security awareness training materials; security plan; other relevant documents or records]. <b>Interview:</b> [SELECT FROM: Organizational personnel that participate in security awareness training; organizational personnel with responsibilities for basic security awareness training; organizational personnel with information security responsibilities].

# What phases of security awareness do organizations go through as their programs mature?

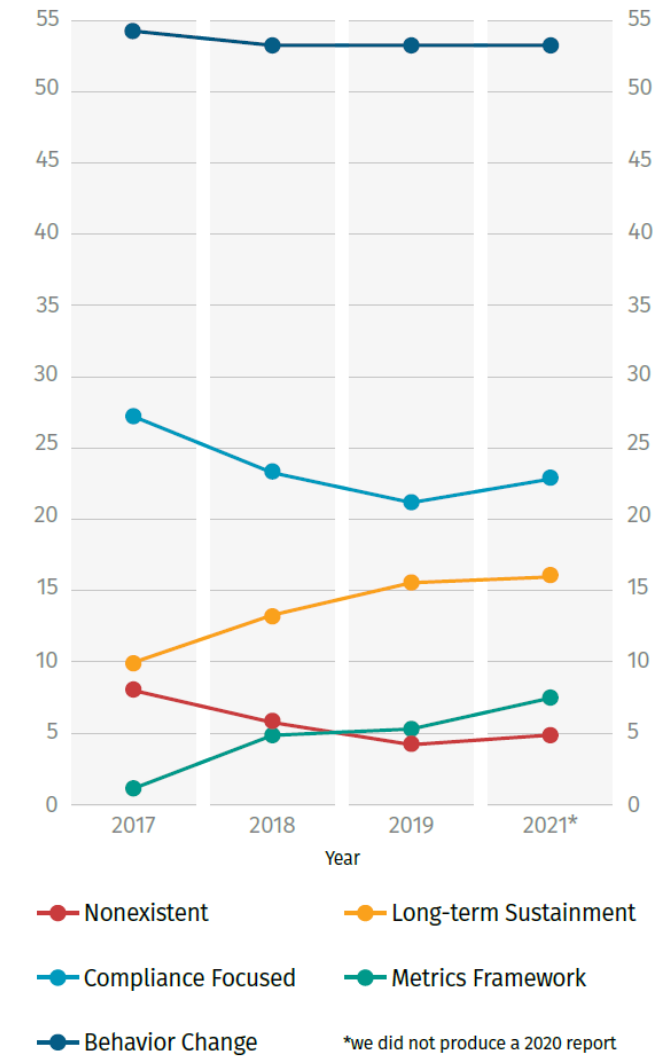


<https://www.sans.org/security-awareness-training/resources/reports/sareport-2021/>

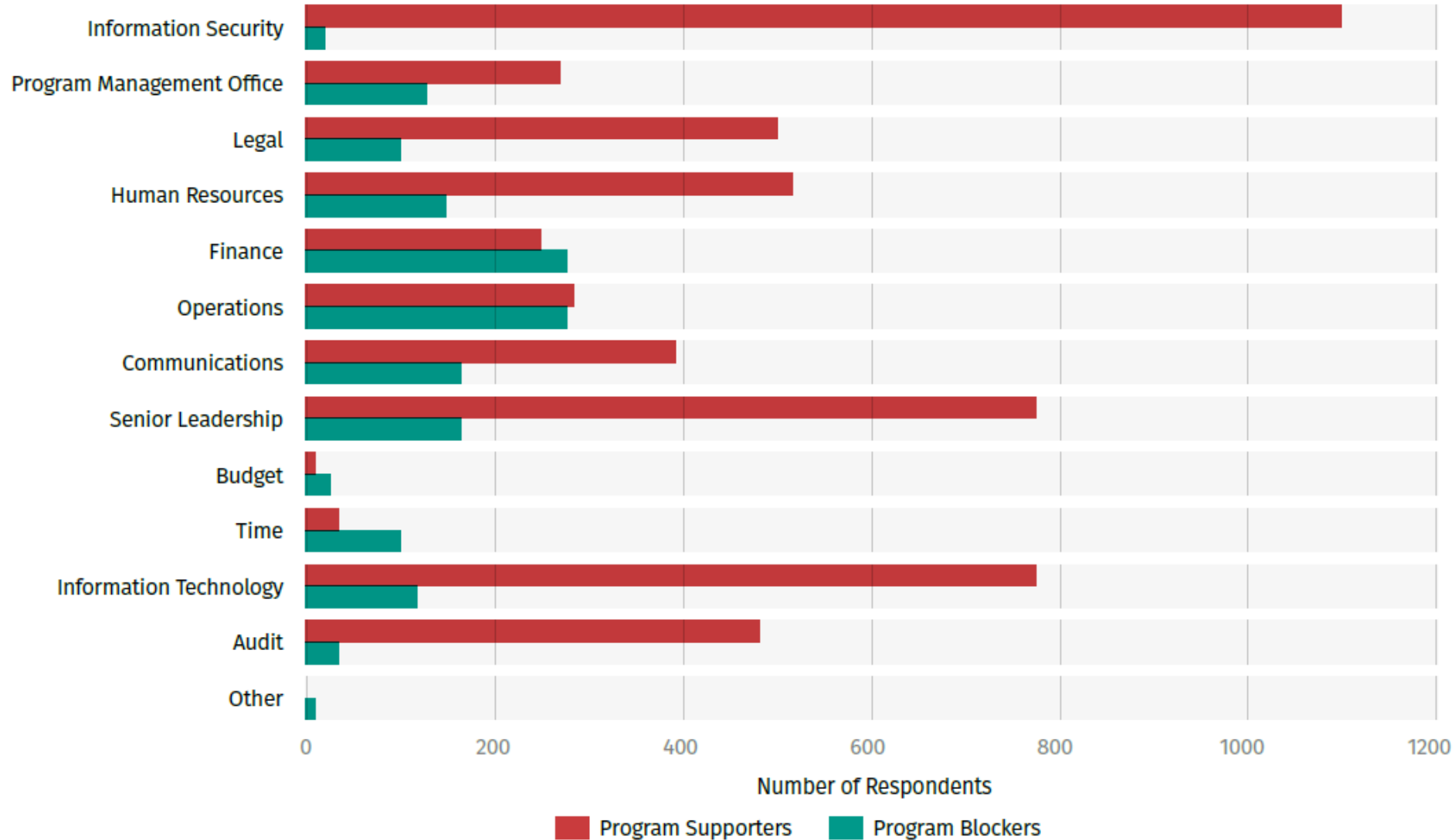
# Benchmarking Maturity Levels



## Program Maturity Over Time



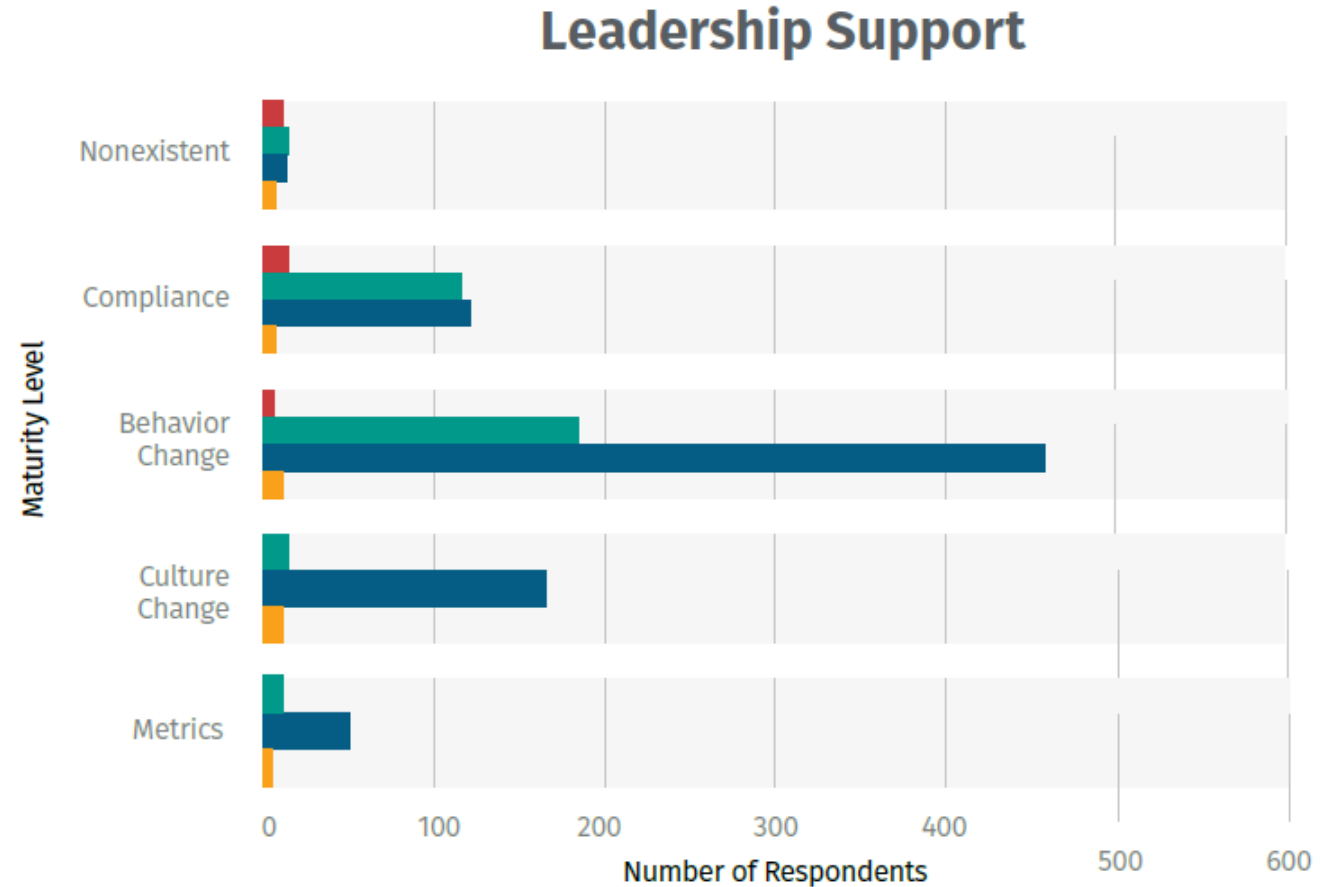
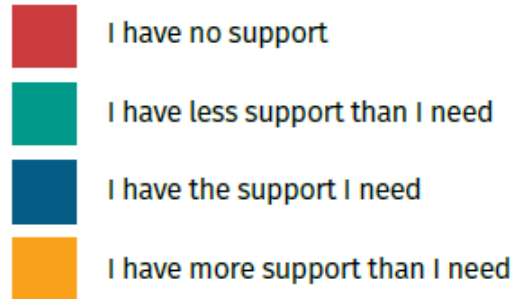
## Reported Program Blockers and Supporters



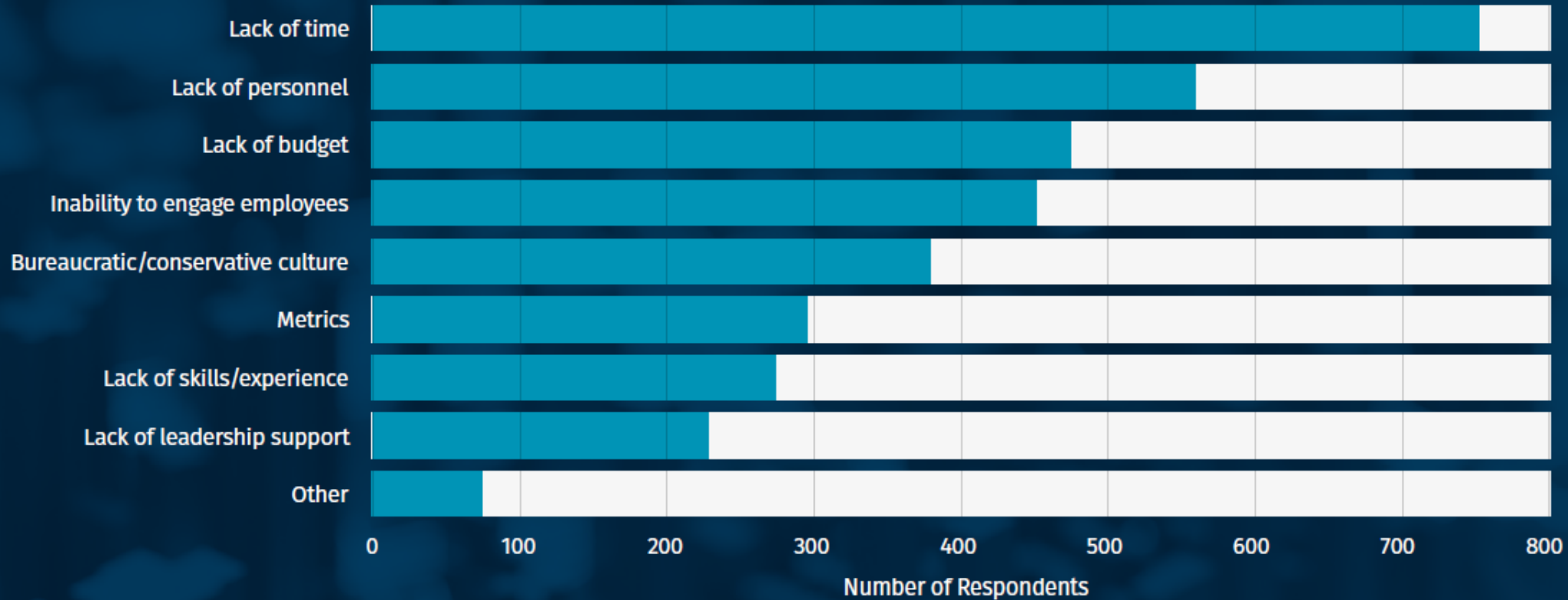
# GAINING LEADERSHIP SUPPORT

Respondent data shows a correlation between executive support and program maturity. As organizational leaders often decide on critical program resourcing, identification of program goals, training time allocation, and program enforceability, executive support is a key ingredient in program success.

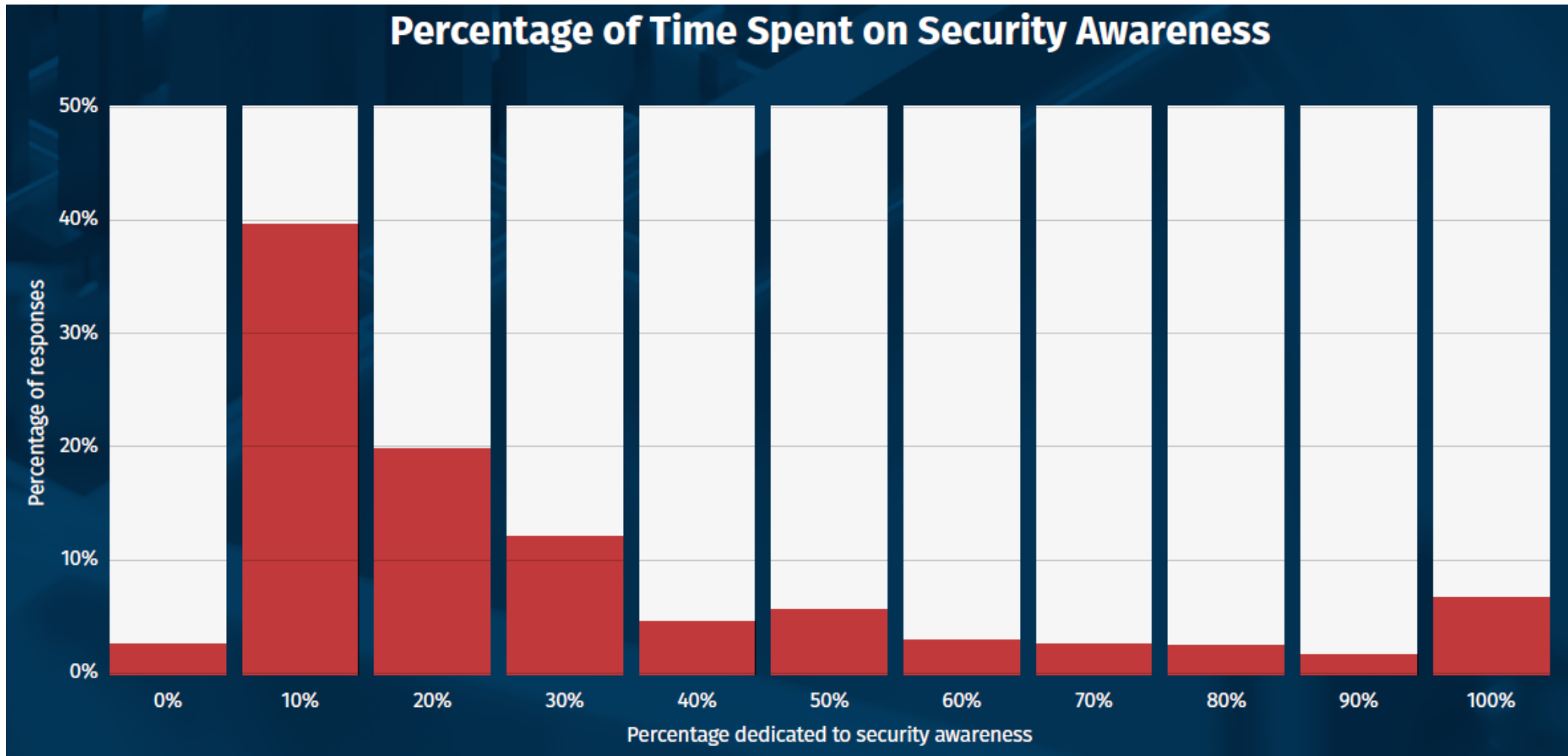
## Support Level



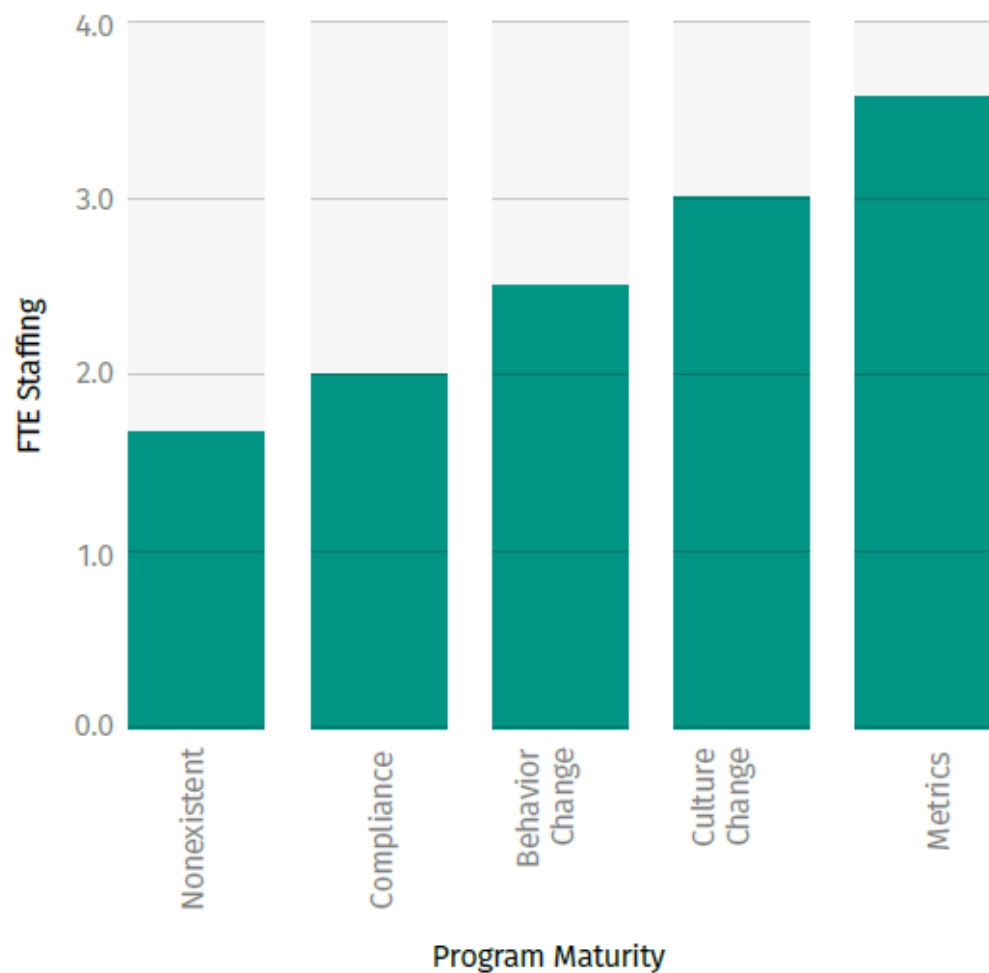
## Top Reported Program Challenges



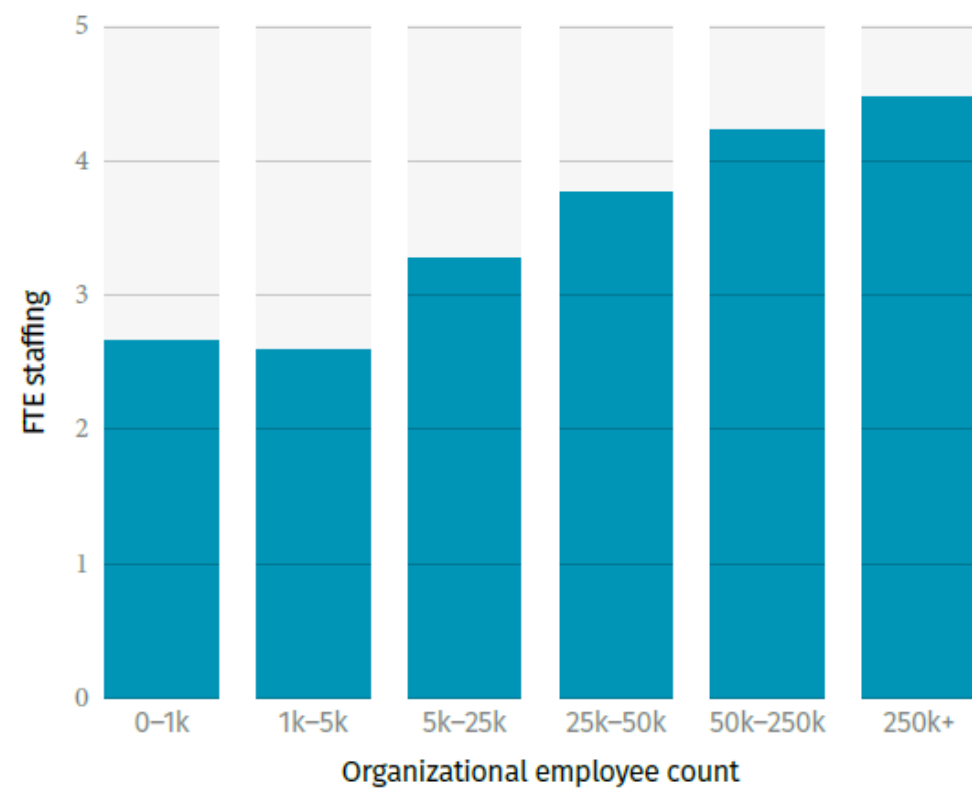
**Over 80% of security awareness professionals reported that they spend half or less of their time on awareness, indicating far too often that security awareness is a part-time effort.**



## Average Number of FTEs by Maturity Level



## Average Number of FTEs by Org Size





# Summary of Key Action Items

- **Have the Right People:** You need 2.5 FTEs to begin changing behavior at an organizational level.

**To achieve a truly mature program, including a strong metrics framework, you will need at least 3.5 FTEs.**

FTE numbers may vary depending on organizational size, structure, and requirements.

- **Provide the Right Title:** Demonstrate organizational commitment to the program, not only by having someone dedicated full-time but also by ensuring they have a title that aligns with the program's goals. In other words, have a title that is focused on managing human risk.
- **Ensure Leadership Support:** Pressure is one of the most effective means to obtain leadership support. Demonstrate to your leadership how other organizations in your industry have mature awareness programs and continue to invest in them.

- **Encourage Partnerships:** Build partnerships and collaborate with others in your organization. This is especially important for any key departments that are blockers, such as Finance or Operations. Get key stakeholders involved in the planning process from the beginning.
- **Buy Time:** If you have the budget, use it to buy yourself time. For example, buy or license materials rather than create your own.
- **Know Your Bias:**

**If you are a technical or security expert, make sure you work with others to create clear messaging.**

Your expertise is a plus as long as you pay careful attention to how it contributes to your program.

# Summary of Key Action Items

- **Improve Communication and Engagement Skills:**  
Be sure you have someone on your awareness team who has the skills required for effective communication and engagement.
  - **Seek out a Champion:** Find a strong champion within leadership. Have that leader help you better understand certain blockers, communicate the value of your program to other leaders, or help you craft your message in the language that business leaders understand and act on.
  - **Improve Perception:** Focus and speak in terms of managing human risk. Human risk is far more aligned with most organizations' strategic security priorities, and it is far more likely to gain leadership buy-in and resonate with a security team.
- Identify top human risks and the key behaviors that manage those risks.**  
Demonstrate how you can better support the security team with security policies, processes, and priorities. Measure key strategic security metrics that leadership cares about.

# Summary of Key Action Items

- **Take Security Training:** Review Appendix B: Career Development for Security Awareness, Engagement, and Culture Professionals.

**Security training will provide you a better understanding of risks and the different technologies, frameworks and approaches to managing them, helping build both your credibility and value.**

<https://www.sans.org/security-awareness-training/resources/reports/sareport-2021/>

## APPENDIX B: CAREER DEVELOPMENT FOR SECURITY AWARENESS PROFESSIONALS

One of the key takeaways from the 2021 report is that your compensation is in part driven by your training and skills, including your understanding of key security topics and the technologies involved. Rightly or wrongly, technical staff are often perceived as more valuable, and improving your technical skills can improve your ability to interact with your technical colleagues. As such, based on the data and findings we have defined a training path to help develop the skills you need to be more successful and be compensated adequately.

### WHERE TO START

If you are new to the world of information security and/or security awareness, or haven't had the chance yet, the very first SANS course you may want to start with is:

- **MGT433: SANS Security Awareness: How to Build, Maintain, and Measure a Mature Awareness Program.** This two-day class lays the foundation of security awareness, managing human risk and ultimately changing organization behavior. For those of you new to security, you will learn concepts like risk, risk management, and risk analysis. For those of you new to communications and engagement, you will learn key concepts such as the AIDA model, Start with Why, Curse of Knowledge, and other models and principles. Course content is based on lessons learned from hundreds of security awareness programs from around the world. In addition, you will learn not only from your instructor, but from extensive interaction with your peers. Finally, through a series of labs and exercises, you will develop your own custom security awareness plan that you can implement in your organization.

### WHAT NEXT

Once you have the basics down and want to develop yourself and your career, you may need to develop your security expertise if you do not have a technical or security background. Understanding the fundamentals will not only help you better understand the risks, but also the behaviors that manage those risks and empower you to more effectively communicate with your security team and security leadership. There are two different five-day courses to consider at this stage in your career. Each has its advantages, depending on what you hope to achieve.

- **MGT512: Security Leadership Essentials For Managers.** This course emphasizes unit to harmonize

an effective security manager speed quickly on information terminology. You won't just learn how to manage this goal, MGT512 covers topics across the entire network, host, application covered in conjunction with that address the overall includes governance and on protecting, detecting, issues.

- **SEC301: Introduction to your security knowledge** Instruction on critical information are fundamental to cybersecurity. This course takes a technical to cybersecurity. It covers cryptography principles, malware, wireless security technologies, backups, virtual machines. All topics are covered at hands-on, step-by-step so you to grasp all the information some of the topics are in world cybersecurity foundation of your career years to come.

Not sure which one of these two courses to take? If you are looking for more of a high-level or management perspective to the world of information security, we recommend MGT512. If you want a more hands-on, technical introduction to the tools and technology of cybersecurity, then we recommend SEC301.

### INTERMEDIATE LEVEL

Once you have 2-4 years of experience in security awareness and feel confident in the concepts of both cybersecurity and organizational behavior, MGT521 is what we recommend next.

- **MGT521: Driving Cybersecurity Change - Establishing a Culture of Protect, Detect and Respond.** Cybersecurity is no longer just about technology - it is ultimately about organizational change. Change is not only how people think about security but what they prioritize and how they act, from the Board of Directors on down. Organizational change is a field of management study that enables organizations to analyze, plan, and then improve their operations and structures by focusing on people and culture. SANS MGT521 will teach leaders how to leverage the principles of organizational change, enabling them to develop, maintain and measure a security-driven culture. Through hands-on, real-world instruction and a series of interactive labs and exercises in which you will apply the concepts of organizational change to a variety of



different security initiatives, you will quickly learn how to embed cybersecurity into your organizational culture.

### ADVANCED LEVEL

Once you have 5-7 years of experience and want to truly develop your security leadership skills, consider SANS MGT514. This will walk you through the strategic planning process and challenges CISOs face. Many people consider this the "CISO Course", that helps develop new and experienced Chief Information Security Officers to become better security leaders. By better understanding CISO challenges, priorities and concerns, you can more effectively collaborate with them and communicate in their terms and language.

- **MGT514: Security Strategic Planning, Policy, and Leadership.** This course gives you tools to become a security business leader who can build and execute strategic plans that resonate with other business executives, create an effective information security policy, and develop management and leadership skills to better lead, inspire, and motivate your teams.

By actively growing your skills and knowledge, you can not only become a more effective leader, but also dramatically improve and broaden your career opportunities.

# What should be in an information security training course ?

- Create a course outline of topics
- Prioritize the topics for teaching the course

# Training courses examples...

**Tip #3: Explain to the employees that while you make the best effort to secure company infrastructure, a system is only as secure as the weakest link**

- ▶ You don't want them to just comply, you want them to cooperate
- ▶ You can't create a policy sophisticated enough to cover all possible vectors of attack
- ▶ You can't totally dehumanize humans. Humans have weaknesses and make mistakes.



# Training course content example

- A. Physical security
- B. Desktop security
- C. Wireless Networks and Security
- D. Password security**
- E. Phishing
- F. Hoaxes
- G. Malware
  - 1. Viruses
  - 2. Worms
  - 3. Trojans
  - 4. Spyware and Adware
- H. File sharing and copyright

Brodie, C. (2009), “The Importance of Security Awareness Training”, SANS Institute InfoSec Reading Room, SANS Institute



# Training course content example

- A. Password safety and security**
- B. Email safety and security
- C. Desktop security
- D. FERPA Issues (i.e. student information security)
- E. Acceptable Use Policy

Fowler, B.T. (2008), “Making Security Awareness Efforts Work for You”, SANS Institute InfoSec Reading Room, SANS Institute

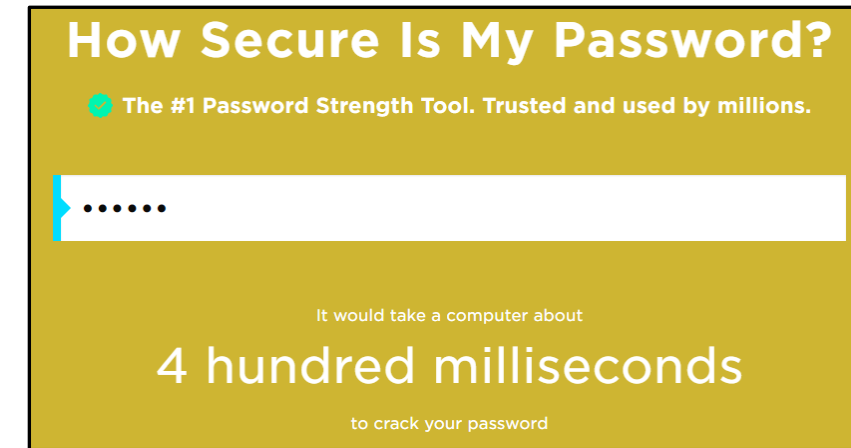
# Training course content example...

## Password safety and security

- 80% of hacking related data breaches involve Brute force or the use of compromised credentials (login and password)
- 37% of all breaches involve the use of stolen credentials

*2020 Verizon Data Breach Investigations Report*

- Security policies need to cover both computer and voice mail passwords
- Every employee should be instructed in how to devise a difficult-to-guess password



**How Secure Is My Password?**

The #1 Password Strength Tool. Trusted and used by millions.

.....

It would take a computer about  
**4 hundred milliseconds**  
to crack your password



**HOW SECURE IS MY PASSWORD?**

.....

It would take a computer about  
**22 MINUTES**  
to crack your password



**How Secure My Password**

Test the strength of my password

DonDiego45&^67

It would take a computer about  
**816 million years**  
to crack your password



# Training course content

## Email and Voicemail

- Email usage policy, including the safeguards to prevent malicious code attacks including viruses, worms, and Trojan Horses
- Best security practices of voice mail usage

### **Phishing Prevention-The 100% rules!**

- Never click a link in an email
- Never open unexpected attachments
- Never provide information, no matter how innocuous it may seem, to unsolicited phone callers, visitors or email requests
- Never agree to an unsolicited remote control session (such as WebEx, GoToMeeting, LogMeIn)
- Your best defense: "Can I call you back?"

# Training course content

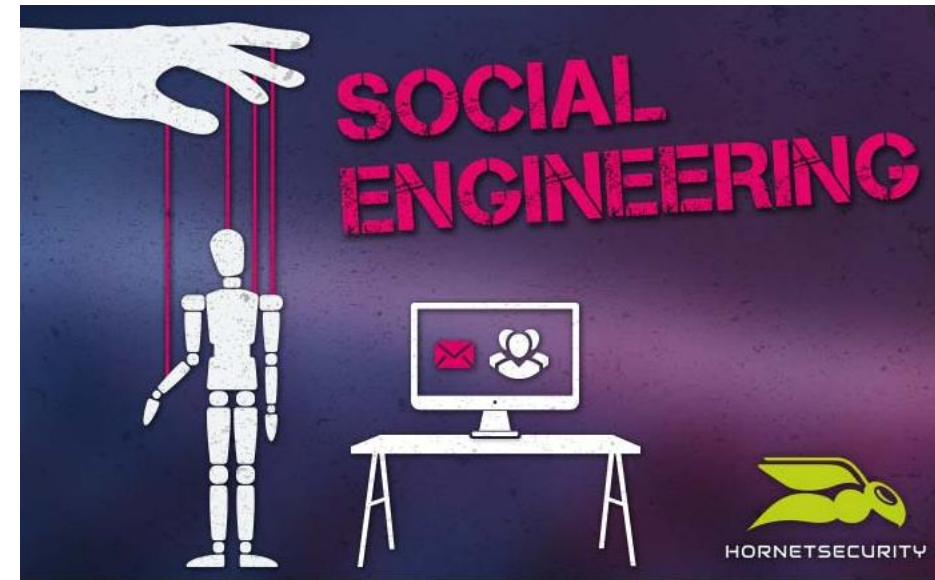
*Every employee should know their responsibility to comply with the policies and the consequences for non-compliance*

## Handling sensitive information

- How to determine the classification of information and the proper safeguards for protecting sensitive information
- The procedure for disclosing sensitive information or materials
- Proper disposal of sensitive documents and computer media that contain, or have at any time in the past contained, confidential materials
- ...

# Creating a Security Aware Organization

*An ongoing information security awareness program is vital - because of the need and importance of defending against social engineering and other information security threats*









# What is social engineering?

- Social engineering attacks have the same common element: deception (with the goal of getting an employee to do something the social engineer desires...)
  - Verify the identity of the person making an information request
  - Verify the person is authorized to receive the information

- ▶ A lot of cyberincidents start with a phone conversation with someone who poses as a co-worker and builds his understanding of company internal structure and operations by asking innocent questions
- ▶ A cybercriminal exploiting social weaknesses almost never looks like one

KASPERSKY Lab



# Common Social Engineering Strategies

- **Posing as**
  - ☐ a fellow employee
  - ☐ a new employee requesting help
  - ☐ someone in authority
  - ☐ a vendor or systems manufacturer calling to offer a system patch or update
  - ☐ an employee of a vendor, partner company, or law enforcement
- **Offering...**
  - help if a problem occurs, then making the problem occur, thereby manipulating the victim to call them for help
  - free software or patch for victim to install



# Warning Signs of a Social Engineering Attack

- Refusal to give call back number
- Out-of-ordinary request
- Claim of authority
- Stresses urgency
- Threatens negative consequences of non-compliance
- Shows discomfort when questioned
- Name dropping
- Compliments or flattery
- Flirting





# What is “just in time training?”

# “Just in time training...”

Data from network incident reporting tools, such as security and information event management (SIEM) systems and data loss prevention(DLP) software... helps understand prevalence of data handling issues

User behavior analytics (UBA) and user entity behavioral analytics (UEBA) provides a way to parse through information collected by SIEM and DLP

UEBA can help provide “just in time training” as a mistake is made

- *UEBA might identify Jane Doe saving a company document to an unapproved internet site (e.g. Dropbox, Box or Google Drive) and deliver a system-generated pop-up that reminds her of the company’s policy on storing company documents in an authorized ecosystem....*

*Pendergast, T. (2016) “How to Audit the Human Element and Assess Your Organization’s Security Risk”, ISACA Journal, Volume 5 pp. 20-24*

# “Just in time training...”

- *If Jane does it again, the system then might provide a quick video on the reasons why it is best to avoid an unapproved cloud storage system.*
- *Months later, if Jane makes the same mistake again, she might be automatically enrolled in a 15-minute course on approved cloud storage and the appropriate way to store company documents. This is a perfect example of delivering the right training to the right person at the right time.”*

*Pendergast, T. (2016) “How to Audit the Human Element and Assess Your Organization’s Security Risk”, ISACA Journal, Volume 5 pp. 20-24*

# Test Taking Tip

*- If you don't know the answer ... guess  
and then move on -*

**Your score will be higher if you guess and move on even if your guess is wrong**

Here's why:

- Most certification tests do not penalize for wrong answers. That is, they only count the number of correct answers in computing the score
- In a 4-option multiple choice test, guessing at questions to which you do not know the answer is likely to get you an additional right answer  $\frac{1}{4}$  of the time
- Guessing, and then moving on, gives you time to answer the questions that you do know, raising your score

# Quiz and Solutions

Which of the following would MOST effectively reduce social engineering incidents?

- a. Security awareness training
- b. Increased physical security measures
- c. Email monitoring policy
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- b. Ask the security administrator
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  - b. Firewalls
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  - d. Traffic analysis

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- c. Identifying threats
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- b. Return or destruction of information
- c. Network and intrusion detection
- d. A patch management process

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- a. The organization does not encrypt all of its outgoing email messages
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- b. Assignment of criticality levels to data
- c. Implementation of access rules to data and programs
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- b. Programmers
- c. Systems analysts
- d. Librarians

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As his company's Chief Information Security Officer (CISO), George needs to demonstrate to the Board of Directors the necessity of a strong risk management program. Which of the following should George use to calculate the company's residual risk?

- a. threats x vulnerability X asset value = residual risk
- b. SLE x frequency = ALE, which is equal to residual risk
- c. (threats x vulnerability x asset value) x control gap = residual risk
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# Agenda

- ✓ In The News
- ✓ Awareness and Training InfoSec Controls
- ✓ Creating a Security Aware Organization
  - ✓ Control inventory baselines
  - ✓ The Threat landscape
  - ✓ Employee risk
  - ✓ Training course content (examples)
- ✓ Test Taking Tip
- ✓ Quiz



# Protecting Information Assets

## - Unit# 5 -

### Creating a Security Aware Organization