Sterling Ideas

PROFESSIONAL IT SERVICES

CYBERSECURITY ESSENTIALS FOR BUSINESS OWNERS

OWN IT. SECURE IT. PROTECT IT.

OWN IT.
SECURE IT.
PROTECT IT.

Contents

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PROFESSIONAL IT SERVICES

Introduction

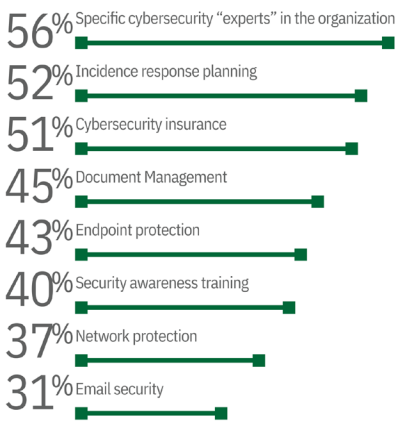
Cybercrime and cyberattacks are becoming more prevalent with each passing day. Specifically, small- to medium-businesses (SMBs) are being targeted by attackers because they often do not have the proper protections or expertise to safeguard themselves. The COVID-19 pandemic created an unprecedented jump in reliance on technology: staff were forced to work from home, orders needed to be placed online instead of in person, and digital advertising became key to reaching a world full of people bunkered in their homes. However, not everyone increased their security when they increased the complexity and importance of their technology.

66% of small businesses are very concerned about cybersecurity risk.

Cybercrime is a significant threat to businesses. It can lead to disruption of operations, breach of business and customer data, unauthorized access to networks, and more. **The average cost of a data breach for a small- to medium-business is a staggering $149,000.** On top of that, 80% of SMBs worry about becoming the target of cybercrime in the next six months. And cybercriminals are only becoming more and more creative. From old school email attacks to data encryption and exfiltration, there are no rules when it comes to how you can be attacked.

Over the last few years, the line between work and personal life has become more blurred than ever. Employees are asked to access work data from their personal home networks and sometimes even from their personal devices. Your business's network has never had more ways to access it, meaning there are more doors than ever for an attacker to slip through.

Percentage of Organizations who **DO NOT HAVE** these critical cybersecurity solutions in place.



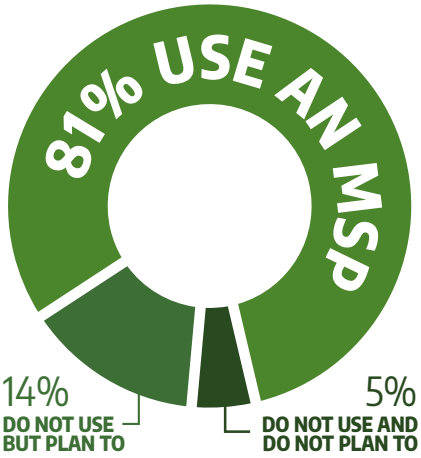
51% of small businesses say they are not allocating any budget to cybersecurity.

And if you think that you are safe because your information is stored in the cloud, think again. As more and more applications are moving to the cloud, malicious actors are getting better at evading detection by standard security measures and protocols. The act of distributing ransomware and holding sensitive data is on the rise as organizational data is ranging further and further outside the walls of your company.

Evolving from simple malware, ransomware has become more sophisticated and efficient in a short period of time. Cybercriminals are now targeting local backups, which foil the efforts of the security staff to restore encrypted data. The days of good backups being a cyberattack response plan are over - that is simply not enough anymore.

While a lot has changed over the past two to three years, some things remain

Organizations' use of an MSP



consistent. Email remains the most favored method of cybercriminals, with over 91% of attacks being initiated by email. Email providers' default security settings are not enough to detect and remove phishing emails from your email system. This can lead to malware being delivered and initiated on a system without the user's knowledge. Attackers will often wait for days, weeks, or even months to study how best to attack the compromised machine, looking for the most likely way to get a ransom paid.

Cybercrime is obviously a growing threat to the SMB industry; however, few businesses are in a position to properly protect themselves. Most are under-educated when it comes to the nuances of cybercrime. In a battle that is all about being one step ahead of the opposition, this lack of expertise is putting businesses in the crosshairs of attackers. Without a plan, organizations don't know how to react or what steps to take when their network and systems are compromised.

Here the role of Managed IT Service Providers (MSPs) becomes crucial. Your MSP should be your partner in protecting your company from cybercriminals. From network setup to employee education, patching and updating systems to auditing network access, your MSP provides the expertise you need to allow you and your staff to do what you do best.

An MSP should identify your current level of protection and implement a plan to increase it to the optimum level. Enterprises are recognizing they can't accomplish this alone and are joining hands with MSPs to eliminate and prevent cyberattacks and threats.

Eight out of ten surveyed SMBs are working with an MSP, and four of them want to keep working with their current security partners. Three companies out of ten plan to switch to a different MSP in the coming months, and 12% of SMBs that don't work with an MSP plan to partner up with one within the next twelve months.

9 in 10 employees say their organization would consider switching to a new MSP if they offered a solution that met their needs.

When asked what benefit they expected to see from using an MSP, fifty percent of SMBs said increased security even if they had outsourced their cybersecurity.

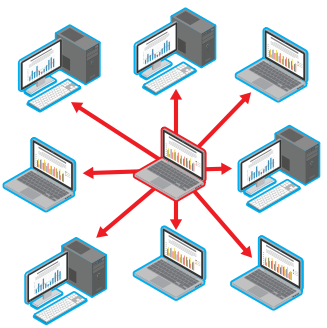
Your staff are experts for your business, each one with unique skills necessary to keep your company going. **We are also experts at what we do.** Don't risk your company's future by not protecting it from the growing list of online criminals who are after your data. Give yourself peace of mind, knowing that you have a team of experts in your corner working diligently to keep you safe. That's what we do best, and we're proud that our work helps our clients spend their energy focusing on their clients, patients, students, and customers. Not their IT issues.

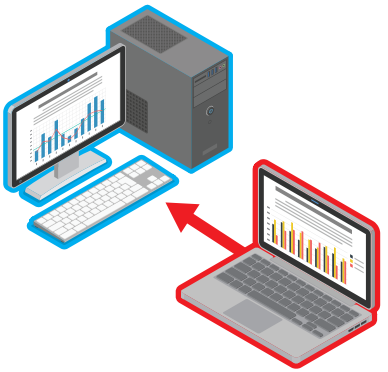
PHISHING

Phishing is the practice of stealing someone's information through email. You probably know some classic phishing techniques – the Nigerian prince who needs to borrow a few thousand dollars so he can send you his family's fortune, anyone? But not all phishing attempts are so obvious, nor are they always after the same prize. Credit card numbers, passwords, business information, personal information – any of these things could be the goal of a phishing email. Attackers have gotten much more sophisticated with their phishing attempts lately, using lookalike domains and copying legitimate email templates to make their attacks look as realistic as possible. Phishing is an equal opportunity attacker; anyone can fall for it. Small businesses need to be proactively protecting against phishing and training their staff to detect and report phishing messages.

In 2020, phishing was responsible for more than 80% of reported security incidents.

	PHISHING	SPEAR PHISHING
APPROACH	Spray & Pray	Targeted Attack
TARGETING	Broad & Automated	Specific employee and/or company
HACKING LEVEL	Not Very Sophisticated	Requires Advanced Techniques
THE ATTACK	More Prone to Errors	Harder to Detect
WHAT THEY'RE AFTER	Usernames, Passwords, Credit Card Details, etc.	Confidential Information, Business Secrets, etc.





Phishing Techniques & Tactics

While there are no rules for how to phish, attackers often use the same proven tactics to coerce their victims into giving away information that they should not. They use things that they know people are susceptible to, trying to override your brain and any training you may have to get you to act without thinking. Two of the easiest ways to spot a phishing attempt are to look for appeals to emotion and urgency.

Emotion

Many attackers will prey on your emotions in some way when sending out phishing emails. The most common is fear:

> "We've seen what you've been doing online and are going to call the cops if you don't send money to the link below."
>
> "You haven't paid your taxes in five years and the IRS is going to seize your home. Click on the link below to file for an extension."
>
> "Your political rival is definitely going to win unless you sign this petition linked below."

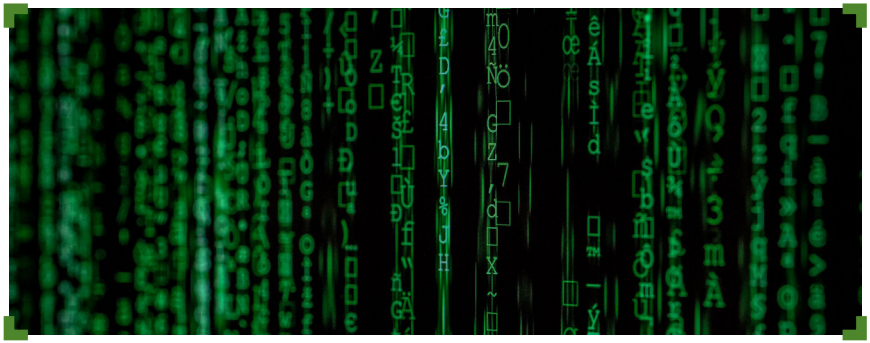
Fear is a powerful weapon because when faced with statements like this, people often begin to panic instead of thinking carefully through the situation. Many people know full well that they have been paying their taxes on time their whole lives, but when faced with a statement saying they have not and that their home is on the line, they begin to question themselves.

The other, though less common, way to use emotion is through funny/happy content that people do not expect to be a threat.

> "23 of the cutest puppies on the internet"
>
> "Enter to join a free giveaway from Company X"

Urgency

The other tell-tale sign of phishers is creating a sense of urgency. This is often coupled with the use of fear, but does not have to be. Again, by making something seem extremely time-sensitive, the attacker tries to force you to make a snap judgment decision. Whenever you receive an email that is demanding urgency, take a moment to step back and take an unbiased look at the situation. Is this an email you were expecting? Is the source legitimate? Is there a way you can externally verify whether what they are claiming is true?



SPEARPHISHING

Spearphishing is a type of phishing, but it is much more sophisticated. Instead of making a generic email and sending it to a massive audience, attackers do the opposite. They make a very specific email and send it to a very specific group of people, often only one individual. The goal of spearphishing is quality over quantity. An attacker will take the time to build a convincing email that will trick a specific person who has something the attacker wants. Attackers will study targets on LinkedIn, social media, and other online platforms and send a tailor-made email that the individual is more likely to fall for. Maybe your CFO posted a picture of himself and his son at the local college's football game last weekend, which the attackers saw. The CFO then gets an email (supposedly from the school's athletic association) telling him to "Click the link below for a chance to get free tickets to next week's game!" The timing of the email makes sense and there is some emotion in the decision, increasing the odds of the CFO not noticing the typo in the email address.

Owners and executives have far more access to business details than other employees, but they rarely get more security training. People of authority in your organization need to be made aware that they are potential targets, and they need to be trained to spot fraudulent messages when they inevitably occur.

MAN-IN-THE-MIDDLE (MITM) ATTACK

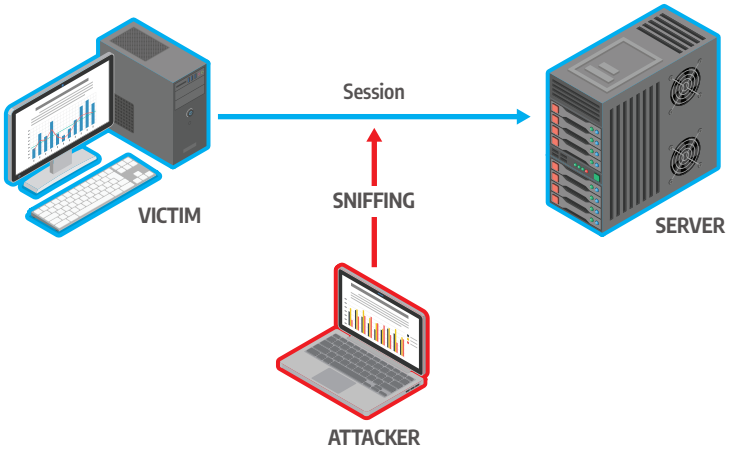
A MitM attack occurs when a hacker inserts himself between the communications of a client and a server. The most common form of MitM attacks is session hijacking.

Cybercriminals use session hijacking to gain control of the victim's sessions and get access to resources or data. The most common method is IP spoofing where the hijacker uses the IP of the trusted client to avail unauthorized services from a server or application.

Once the attacker has successfully spoofed the target, he sits in the middle of the traffic and cannot only get copies of all the information flowing through but also can edit what the target sends back to the victim's machine without the victim being the wiser.

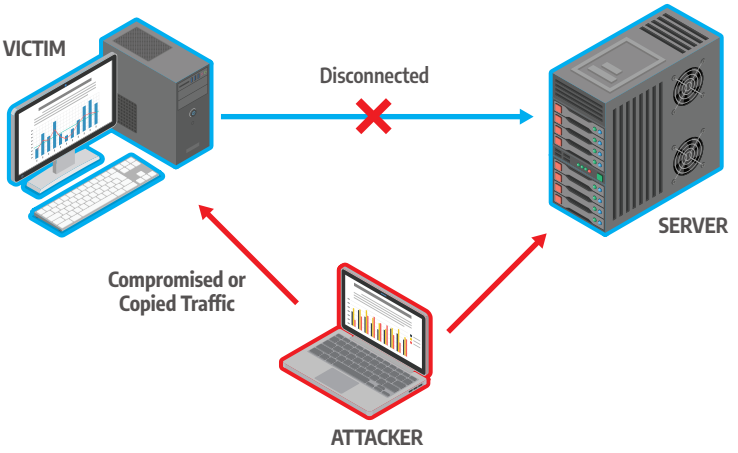
More than one in four small businesses have no security plan at all.

STEP 1: Hijacking the Session



95 PERCENT OF HTTP SERVERS ARE **VULNERABLE** TO **MitM** ATTACKS

STEP 2: Assuming the Victim's IP Address



Macro viruses

Macro viruses target the initialization sequence of an application to compromise programs such as Microsoft Excel or Word.

Trojans

Trojans are non-replicating viruses that gain unauthorized access to a system. Trojans often camouflage themselves in the form of legitimate software.

System or boot-record infectors

These infectors attach to executable codes residing in parts of a disk. Boot-record infectors can connect to a hard disk's Master Boot Records and even boot sectors of USB flash drives. The infectors are initialized when someone boots using the compromised disk or drive.

Polymorphic viruses

Polymorphic viruses replicate endlessly to sabotage systems. They use dynamic encryption keys every time to avoid detection.

Stealth viruses

Stealth viruses hide under the guise of system functions. They also infect your computer's defenses to stay undetected.

File infectors

File infectors find their way in your system through executable codes like .exe extensions. The infector becomes active when you access the .exe file or the executable code.

Logic bombs

Logic bombs are pieces of malicious codes that get initialized when predefined conditions are met. Attackers can program logic bombs to serve a range of purposes.

Worms

Worms don't need a host file to propagate themselves on a network or system. They are self-contained forms of viruses.

Droppers

Droppers help viruses find their way into your networks and systems. Most often, your antivirus will not detect droppers as they don't contain the malicious code; they just lead to it.

Ransomware

Ransomware can take the form of any virus that holds a victim's data hostage for ransom. Ransomware attacks often encrypt data or files, and attackers demand money in exchange for decryption keys.

66 Days

The average number of days to discover a cyberattack

MALWARE ATTACK

Malware (or malicious software) is designed for compromising a system for a purpose. A user can unknowingly download malware that infects a system and replicates itself. Malware can be designed to act in many ways, just like software. Some popular types of malware include:

1. Macro viruses
2. Trojans
3. System or boot-record infectors
4. Polymorphic viruses
5. Stealth viruses
6. File infectors
7. Logic bombs
8. Worms
9. Droppers
10. Ransomware

600%

Increase in cybercrime due to the COVID-19 Pandemic

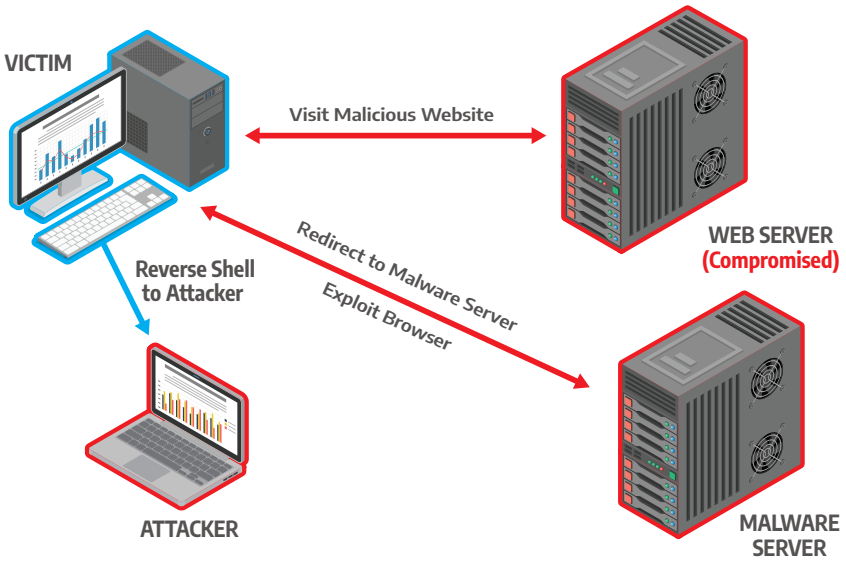
DRIVE-BY ATTACK

Drive-by attacks use various online resources to compromise a user's system. The malicious code can be inserted in internet ads, HTTP or PHP codes on websites, or even applications. Contrary to other forms of cyberattacks, a user doesn't have to do anything to initialize the malicious software or virus. A single click on a pop-up window or website link can do the job.

Drive-by attacks are increasingly used to spread viruses and malware. The attacks take advantage of security vulnerabilities in apps or websites to exploit victim systems. These include not updating the app, flaws in security patches, bugs, and more.

The attacks also run in the background and are not visible to the user. As a result, you can't take any concrete steps to identify incorrect codes. Only being proactive can help businesses protect themselves from drive-by attacks.

ONE HALF
of all cyberattacks specifically target small businesses.



92 PERCENT
of Malware is Delivered by Email.

IN 2018 HACKERS STOLE **160,000,000** PERSONAL RECORDS.

73 PERCENT
of Passwords are Duplicates.

PASSWORD ATTACK

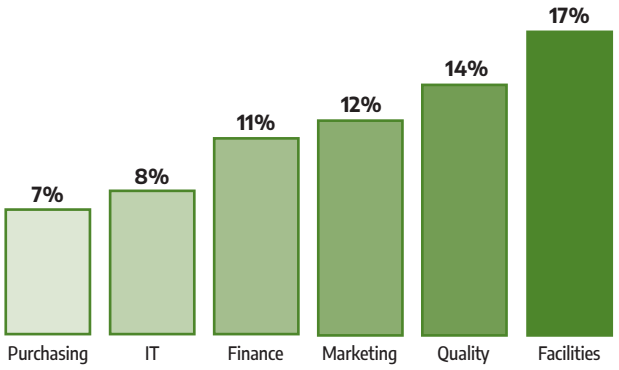
Password attacks enable cybercriminals to gain unauthorized access to user accounts and networks. The days of writing down your passwords on a sticky note or typing your passwords into the notes section of your cellphone are long gone. Not using a protected storage method for your credentials is essentially asking for your accounts to be compromised. Password re-use also sets you up for failure. Anytime an online service gets hacked and account credentials are compromised, they end up on the dark web. Attackers will then take these known passwords and try them for other accounts owned by the same person. Using unique passwords and storing them in a secure password manager all but eliminates these issues.

If they can't find your passwords, attackers may spy on your network, use decryption tools, phish you, or use brute force tools to gain access to your accounts. A range of precautions can help save you from these password attacks. Setting systems to lock out after a certain number of wrong attempts can be useful, especially if you get alerted when this has occurred. Using multifactor authentication is another simple yet excellent way to keep your accounts safe from prying eyes.

NOTABLE FACTS

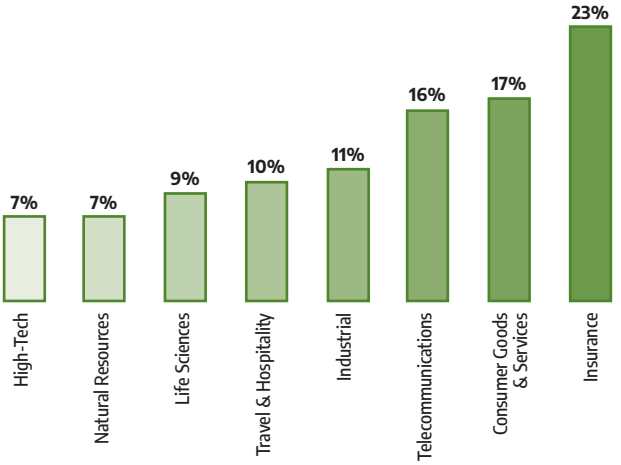
WHO FALLS FOR PHISHING?

Average Failure Rate, By Department



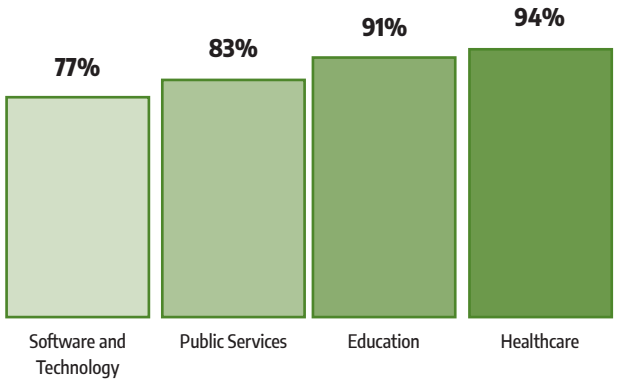
RANSOM RESPONSE BY SECTOR

23% of Response Work is Insurance



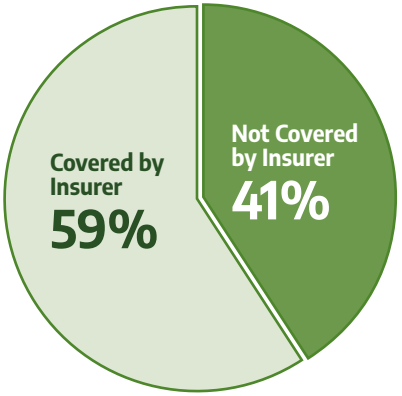
RATES OF PASSWORD REUSE

Reported Password Reuse of Employees Per Sector



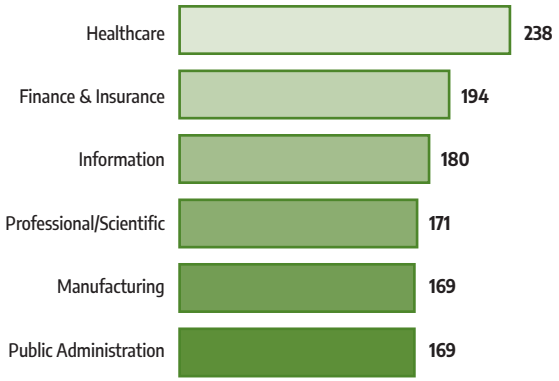
CYBERINSURANCE PAYMENTS

Insurance Typically Covers 59% of Ransom, If Paid



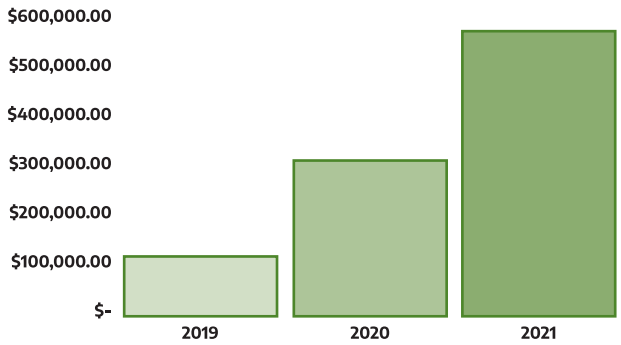
WHO WAS BREACHED IN 2021?

Top 6 Sectors Breached in 2021



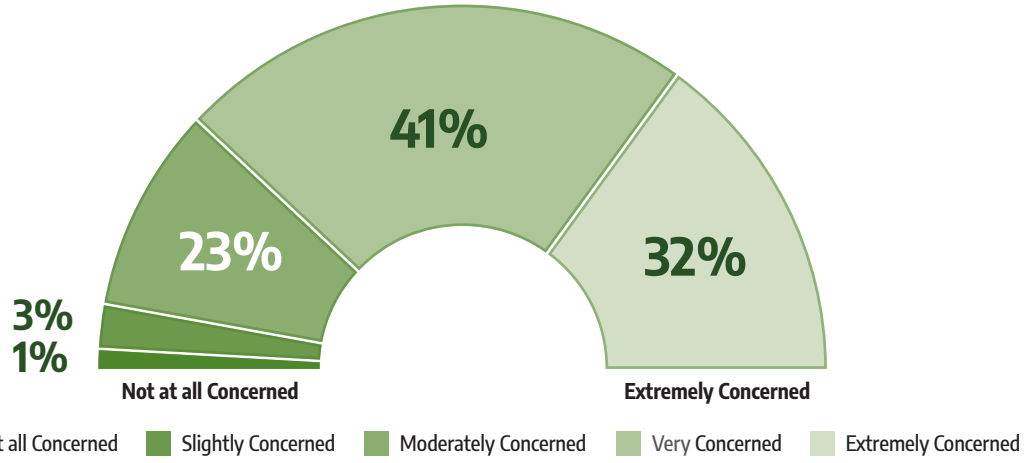
AVERAGE RANSOM PAYMENTS

82% Growth in 2021 in Typical Amount Actually Paid



CLOUD SECURITY

73% of Firms are Very Concerned to Extremely Concerned



5 Crucial Elements of an Effective Cybersecurity Program:

1. Offense Informs Defense
Learning and acquiring knowledge from actual attacks that compromised your system can lead to effective and practical defenses. Your defense should be built only on controls that have proven successful in preventing real-world attacks for the best results.

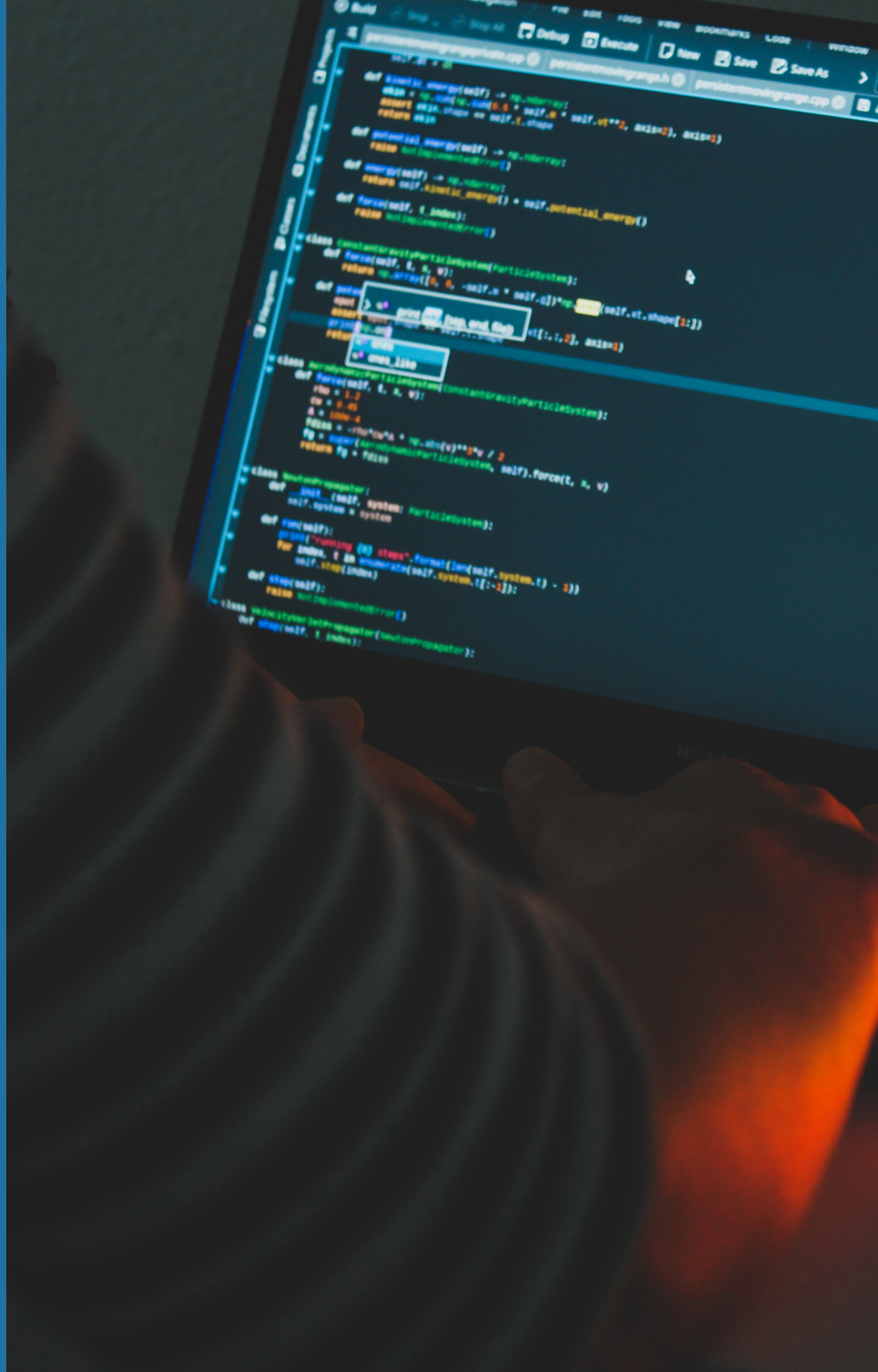
2. Prioritization
Businesses should only focus on controls that can reduce risk most effectively and protect the organization from dangerous cyberthreats. Also, the control should be feasible enough to be implemented in your computing environment.

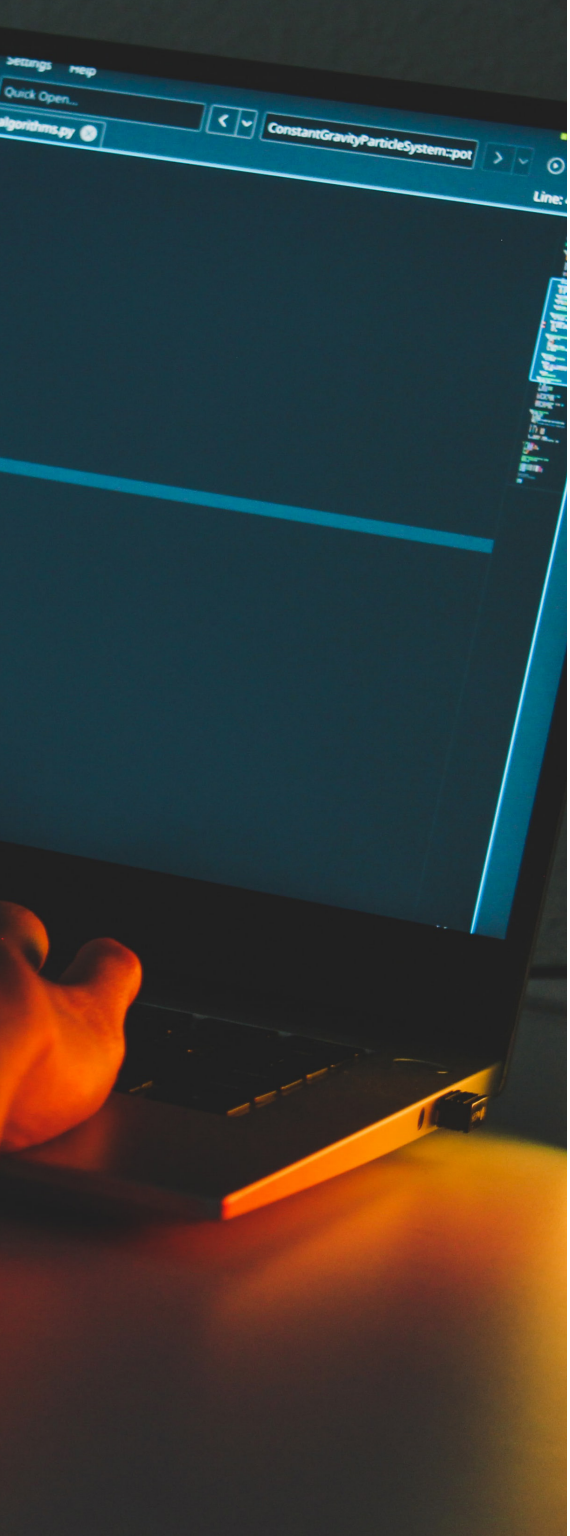
You can identify Sub-Controls to implement by visiting the CIS Implementation Groups.

3. Measurements and Metrics
You should have standard metrics or KPIs in place so that all stakeholders like IT, executives, officers, and auditors can stay on the same page. Metrics are also necessary to monitor the effectiveness of your security measures and make improvements.

4. Continuous Diagnostics and Mitigation
You should always be proactive and monitor your security measures' effectiveness. Any issues should be resolved as soon as possible to ensure the integrity of the following actions.

5. Automation
Automation helps businesses ensure compliance with controls and gain a scalable and reliable way to fight off cyberthreats. Automation also increases efficiencies and saves both time and labor.





The CIS Controls™ is a set of **security best practices** that help businesses mitigate and protect themselves against the **most common** cyberattacks and threats out there.

They were developed and are maintained by IT and security experts at the **Center for Internet Security (CIS)** and are recognized by businesses and governments globally.

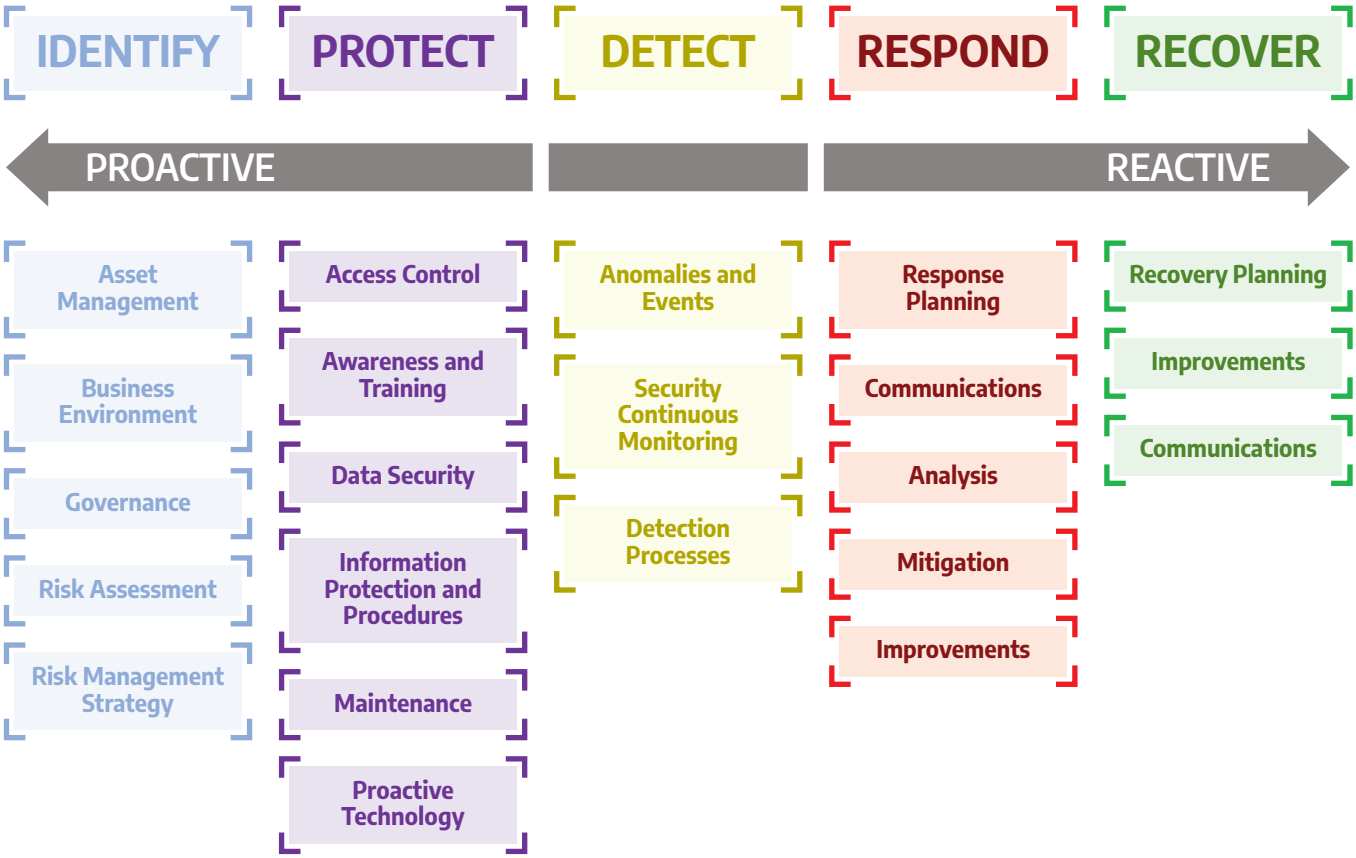
The List of Controls P20

NIST Cybersecurity Framework

The NIST Cybersecurity Framework enables businesses and enterprises to evaluate the risks they encounter. The framework consists of three parts.

The Framework Core presents a range of references, outcomes, and activities associated with aspects and approaches to cyberdefense. **The Framework Implementation Tiers** help organizations establish their approach to cybersecurity and clarify their stance to all stakeholders. The tier also portrays the degree of sophistication of the management approach. **The Framework Profile** contains a collection of outcomes the enterprise picked from the categories and subcategories based on its risk evaluation and requirements.

Organizations can create a "Current Profile" based on the framework that includes the cybersecurity activities and goals the company aims for. Then it can develop a "Target Profile" or go for a baseline profile that meets the organization's specific industry needs. Ultimately, the organization can craft actionable steps to achieve the target profile.



CIS Controls™

The CIS Controls™ is a set of 18 actions that make up the best practices to tackle major attacks against systems and networks. The best practices are developed by a group of IT experts with years of experience in cybersecurity. They come from a range of industries including government, defense, healthcare, education, retail, manufacturing, and others. The CIS Controls are considered to be an international-level collection of best security practices.

Over the years, various forms of cyberattacks have targeted businesses. They include data breaches, stealing of credit card information, theft of identity and intellectual property, denials of service, privacy breaches, and much more. Experts have developed a range of security protocols to address these cyberthreats, which is termed as cyberdefense.

The IT Industry uses a plethora of resources and tools to counter cyberthreats. We also have different technologies, security controls, vulnerability databases, certifications, training material, and security checklists. We have access to studies and reports, tools, notification services, and more to keep us protected from any form of cyberthreat. The IT Industry also depends on a number of regulations, risk assessment frameworks, and security requirements to keep safe from cybercrime.

However, this overload of information and technology often leads to confusion. The competing security measures and options can paralyze an organization from taking the required step to counter cybercrime. In the present day, the business process has grown more complex along with the proliferation of mobile devices and expanding dependencies. The advance in technology has led to the distribution of data across several channels, even outside the organization. As a result, security has transformed from a standalone problem to a multi-faceted threat in this interconnected world.

The average cost of a ransomware attack on a business was $133,000.

The situation brings up the need to act as a community and come up with solutions and support for different industries, sectors, and partnerships. We need to use our knowledge and advancing technology to create solutions that address the crucial aspects of an organization's risk management approach. Such an approach will be a step in the right direction and help enterprises take the proper steps to resolve security issues. The best way to do this is to follow a roadmap of fundamentals that help organizations develop their cyberdefense and security protocols.

The CIS Controls™ were developed based on the above principles to help organizations take a holistic approach towards cybersecurity. They were originally created as a grass-roots program to help cut down the confusion and focus on fundamental actions that enable a business to overcome cyberthreats. The controls are intrinsically valuable and provide the data and knowledge to organizations for staying alert, preventing, and responding to cyberattacks.

The CIS Controls™ are led by CIS®, a global community that offers the following:

- Shared insight into cybercrimes, cyberattacks, and threats to get to the root cause of problems and come up with appropriate measures.
- Documentation of all required approvals and distribution of critical tools.
- Tracking of the nuances of a threat including growth, severity, and intrusiveness.
- Highlighting of the importance of CIS Controls™ to help make them compliant with regulatory frameworks.
- Sharing of knowledge, tools, working aids, translations, and more.
- Tackling the common threats before they become serious and implement roadmaps to solve them as a community.

The CIS Controls are a collection of actions that organizations can implement, use, and scale. The controls also comply with most applicable laws and security safeguards and are backed by the IT Community.

We help our clients align with the CIS Controls™ to help safeguard their businesses.

Doctrines of Effective Cyberdefense

As we already discussed, there are five tenets to a reliable cybersecurity program:

Offense informs defense: Build more effective security measures learning from past attacks and threats. Only controls proven to be effective should be considered.

Prioritization: Prioritize the controls that have been effective in the real-world against threats. The ease of implementation should also be a consideration.

Measurements and metrics: Measurements and metrics are essential to assess the effectiveness of your security measures. They also enable all stakeholders in your security team to speak the same language.

Continuous diagnostics and mitigation: Test and assess your security protocols regularly to help implement the next steps.

Automation: Automate your cybersecurity activities to ensure compliance and gain a reliable and scalable cyberdefense.

The CIS Controls' best practices help enterprises to counter and prevent cyberattacks and threats. The controls are divided into three categories- basic, foundational, and organizational controls.

THE IMPLEMENTATION GROUPS

The CIS understands that not every business or organization will have the means, budget, or requirement to properly implement all the safeguards that they recommend.

To combat this, all of the **Safeguards** underneath each **Control** are categorized into **Implementation Groups.**

Each **Implementation Group** builds on the one before it, so **IG2** includes all the **Safeguards** from **IG1**, and **IG3** includes all the **Safeguards** from both **IG1** and **IG2.**

A good goal for an organization or business of any size is to start with implementing everything that is part of **Implementation Group 1 (IG1).**

Once the business or organization has implemented all **IG1** safeguards (depending on requirements and budget), it can then start to implement **Safeguards** from **Implementation Group 2 (IG2).**

Finally, again depending on requirements and budget, it can then start to implement **Safeguards** from **Implementation Group 3 (IG3).**

Each of the 18 CIS Controls is made up of multiple **Safeguards**. There are 153 in total. These 153 **Safeguards** are categorized into three (3) groups: **Implementation Group 1 (IG1)** has 56, **Implementation Group 2 (IG2)** has 74 & **Implementation Group 3 (IG3)** has an additional 23.

Implementation Group 1 (IG1) - Basic Cyber Hygiene

In most cases, an **IG1** enterprise is typically small- to medium-sized with limited IT and cybersecurity expertise to dedicate towards protecting IT assets and personnel. A common concern of these enterprises is to keep the business operational, as they have limited tolerance for downtime.

Implementation Group 2 (IG2)

An **IG2** enterprise usually employs individuals or an external party such as a Managed Service Provider (MSP) to help manage and protect IT infrastructure. These enterprises typically have multiple departments with different risk profiles based on job function and mission.

Implementation Group 3 (IG3)

An IG3 enterprise typically employs dedicated security experts that specialize in the different facets of cybersecurity. The assets and data of an IG3 enterprise typically contain sensitive information, and an IG3 enterprise is often subject to regulatory and compliance oversight.

CONTROL 01

01 - Inventory and Control of Enterprise Assets

Safeguards Total 5 | IG1 2/5 | IG2 4/5 | IG3 5/5

Actively manage (inventory, track, and correct) all enterprise assets (end-user devices, including portable and mobile; network devices; non-computing/Internet of Things (IoT) devices; and servers) connected to the infrastructure physically, virtually, remotely, and those within cloud environments, to know accurately the totality of assets that need to be monitored and protected within the enterprise. This will also support identifying unauthorized and unmanaged assets to remove or remediate.

Why Is This CIS Control Critical?

Enterprises cannot defend what they do not know they have. Managed control of all enterprise assets also plays a critical role in security monitoring, system backup, incident response, and recovery. Enterprises should know what data is critical to them, and proper asset management will help identify those enterprise assets that hold or manage this critical data so appropriate security controls can be applied.

External attackers are continuously scanning the internet address space of target enterprises, premise-based or in the cloud, identifying possibly unprotected assets attached to an enterprise's network. Attackers can take advantage of new assets that are installed yet not securely configured and patched. Internally, unidentified assets can also have weak security configurations that can make them vulnerable to web- or email-based malware, and adversaries can leverage weak security configurations for traversing the network once they are inside.

Did You Know?

Nearly 66% of IT managers have an incomplete record of their IT assets. Knowing what IT equipment you have and where is a critical function. We can help with digital documentation of your company's technology inventory.

THE SAFEGUARDS

1.1 Establish and Maintain Detailed Enterprise Asset Inventory
Devices | Identify | ● ● ●

1.2 Address Unauthorized Assets
Devices | Respond | ● ● ●

1.3 Utilize an Active Discovery Tool
Devices | Detect | ○ ● ●

1.4 Use Dynamic Host Configuration Protocol (DHCP) Logging to Update Enterprise Asset Inventory
Devices | Identify | ○ ● ●

1.5 Use a Passive Asset Discovery Tool
Devices | Detect | ○ ○ ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

02 - Inventory and Control of Software Assets

Safeguards Total 7 | IG1 3/7 | IG2 6/7 | IG3 7/7

Actively manage (inventory, track, and correct) all software (operating systems and applications) on the network so that only authorized software is installed and can execute, and that unauthorized and unmanaged software is found and prevented from installation or execution.

Why Is This CIS Control Critical?

A complete software inventory is a critical foundation for preventing attacks. Attackers continuously scan target enterprises looking for vulnerable versions of software that can be remotely exploited. For example, if a user opens a malicious website or attachment with a vulnerable browser, an attacker can often install backdoor programs and bots that give the attacker long-term control of the system. Attackers can also use this access to move laterally through the network. One of the key defenses against these attacks is updating and patching software. However, without a complete inventory of software assets, an enterprise cannot determine if they have vulnerable software, or if there are potential licensing violations.

Even if a patch is not yet available, a complete software inventory list allows an enterprise to guard against known attacks until the patch is released.

Some sophisticated attackers use "zero-day exploits" which take advantage of previously unknown vulnerabilities that have yet to have a patch released from the software vendor. Depending on the severity of the exploit, an enterprise can implement temporary mitigation measures to guard against attacks until the patch is released.

Management of software assets is also important to identify unnecessary security risks. An enterprise should review its software inventory to identify any enterprise assets running software that is not needed for business purposes. For example, an enterprise asset may come installed with default software that creates a potential security risk and provides no benefit to the enterprise. It is critical to inventory, understand, assess, and manage all software connected to an enterprise's infrastructure.

THE SAFEGUARDS

2.1 Establish and Maintain a Software Inventory
Applications | Identify | ● ● ●

2.2 Ensure Authorized Software is Currently Supported
Applications | Identify | ● ● ●

2.3 Address Unauthorized Software
Applications | Respond | ● ● ●

2.4 Utilize Automated Software Inventory Tools
Applications | Detect | ○ ● ●

2.5 Allowlist Authorized Software
Applications | Protect | ○ ● ●

2.6 Allowlist Authorized Libraries
Applications | Protect | ○ ● ●

2.7 Allowlist Authorized Scripts
Applications | Protect | ○ ○ ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

Did You Know?

Knowing what software is deployed in your organization is key. Our tools allow us to track all software in the environment and where it is installed.

CONTROL 03

03 - Data Protection

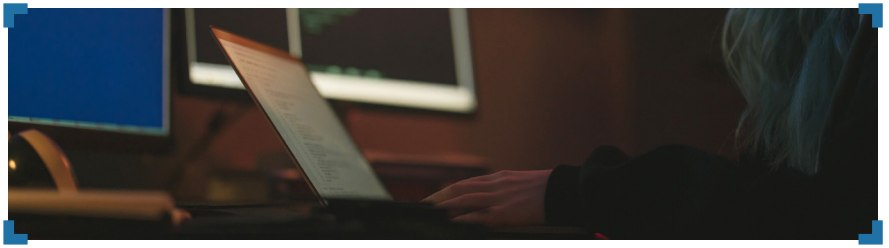
Safeguards Total 14 | IG1 6/14 | IG2 12/14 | IG3 14/14

Develop processes and technical controls to identify, classify, securely handle, retain, and dispose of data.

Why Is This CIS Control Critical?

Data is no longer only contained within an enterprise's border; it is in the cloud, on portable end-user devices where users work from home, and is often shared with partners or online services that might have it anywhere in the world. In addition to sensitive data an enterprise holds related to finances, intellectual property, and customer data, there also might be numerous regulations for protection of personal data. Data privacy has become increasingly important, and enterprises are learning that privacy is about the appropriate use and management of data, not just encryption. Data must be appropriately managed through its entire life cycle. These privacy rules can be complicated for multi-national enterprises of any size; however, there are fundamentals that can apply to all.

Once attackers have penetrated an enterprise's infrastructure, one of their first tasks is to find and exfiltrate data. Enterprises might not be aware that sensitive data is leaving their environment because they are not monitoring data outflows.



Did You Know?

78% of small businesses that store valuable or sensitive data do not encrypt their data, making it easy for hackers to gain access. There are tools and systems available now that can cost-effectively manage data protection and encryption across organizations.

THE SAFEGUARDS

3.1 Establish and Maintain a Data Management Process
Data | Identify | ● ● ●

3.2 Establish and Maintain a Data Inventory
Data | Identify | ● ● ●

3.3 Configure Data Access Control Lists
Data | Protect | ● ● ●

3.4 Enforce Data Retention
Data | Protect | ● ● ●

3.5 Securely Dispose of Data
Data | Protect | ● ● ●

3.6 Encrypt Data on End-User Devices
Data | Protect | ● ● ●

3.7 Establish and Maintain a Data Classification Scheme
Data | Identify | ○ ● ●

3.8 Document Data Flows
Data | Identify | ○ ● ●

3.9 Encrypt Data on Removable Media
Data | Protect | ○ ● ●

3.10 Encrypt Sensitive Data in Transit
Data | Protect | ○ ● ●

3.11 Encrypt Sensitive Data at Rest
Data | Protect | ○ ● ●

3.12 Segment Data Processing and Storage Based on Sensitivity
Data | Protect | ○ ● ●

3.13 Deploy a Data Loss Prevention Solution
Data | Protect | ○ ○ ●

3.14 Log Sensitive Data Access
Data | Detect | ○ ○ ●

THE SAFEGUARDS

4.1 Establish and Maintain a Secure Configuration Process
Applications | Protect

4.2 Establish and Maintain a Secure Configuration Process for Network Infrastructure
Network | Protect

4.3 Configure Automatic Session Locking on Enterprise Assets
Users | Protect

4.4 Implement and Manage a Firewall on Servers
Devices | Protect

4.5 Implement and Manage a Firewall on End-User Devices
Devices | Protect

4.6 Securely Manage Enterprise Assets and Software
Network | Protect

4.7 Manage Default Accounts on Enterprise Assets and Software
Users | Protect

4.8 Uninstall or Disable Unnecessary Services on Enterprise Assets and Software
Devices | Protect

4.9 Configure Trusted DNS Servers on Enterprise Assets
Devices | Protect

4.10 Enforce Automatic Device Lockout on Portable End-User Devices
Devices | Respond

4.11 Enforce Remote Wipe Capability on Portable End-User Devices
Devices | Protect

4.12 Separate Enterprise Workspaces on Mobile End-User Devices
Devices | Protect

04 - Secure Configuration of Enterprise Assets and Software

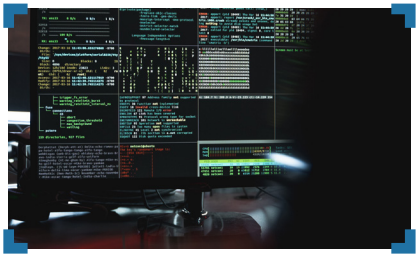
Safeguards Total 12 | IG1 7/12 | IG2 11/12 | IG3 12/12

Establish and maintain the secure configuration of enterprise assets (end-user devices, including portable and mobile; network devices; non-computing/IoT devices; and servers) and software (operating systems and applications).

Why Is This CIS Control Critical?

As delivered from manufacturers and resellers, the default configurations for enterprise assets and software are normally geared towards ease-of-deployment and ease-of-use rather than security. Basic controls, open services and ports, default accounts or passwords, pre-configured Domain Name System (DNS) settings, older (vulnerable) protocols, and pre-installation of unnecessary software can all be exploitable if left in their default state. Further, these security configuration updates need to be managed and maintained over the life cycle of enterprise assets and software. Configuration updates need to be tracked and approved through configuration management workflow process to maintain a record that can be reviewed for compliance, leveraged for incident response, and to support audits. This CIS Control is important to on-premise devices as well as remote devices, network devices, and cloud environments.

Service providers play a key role in modern infrastructures, especially for smaller enterprises that are often not set up by default in the most secure configuration. This is usually to provide flexibility for their customers to apply their own security policies. Therefore, the presence of default accounts or passwords, excessive access, or unnecessary services are common in default configurations.



Did You Know?

Only 14% of small businesses rate their ability to mitigate cyberrisks, vulnerabilities, and attacks as highly effective. Setting up and managing appropriate security and configuration policies and procedures doesn't have to take a lot of effort if you work with a professional.

05 - Account Management

Safeguards Total 6 | IG1 4/6 | IG2 6/6 | IG3 6/6

Use processes and tools to assign and manage authorization and credentials for user accounts including administrator accounts and service accounts.

Why Is This CIS Control Critical?

It is easier for an external or internal threat actor to gain unauthorized access to enterprise assets or data through using valid user credentials than through "hacking" the environment. There are many ways to covertly obtain access to user accounts including weak passwords, accounts still valid after a user leaves the enterprise, dormant or lingering test accounts, shared accounts that have not been changed in months or years, service accounts embedded in applications for scripts, a user having the same password as one they use for an online account that has been compromised (in a public password dump), social engineering a user to give their password, or using malware to capture passwords or tokens in memory or over the network.

Administrative, or highly privileged, accounts are a particular target because they allow attackers to add other accounts or make changes to assets to make them more vulnerable to other attacks. Service accounts are also sensitive as they are often shared among teams, both internal and external; some service accounts may not even be readily known, only being revealed during standard account management audits.

Finally, account logging and monitoring is a critical component of security operations.

Did You Know?

98% of Microsoft Windows' critical vulnerabilities could be mitigated by removing administrative rights from end-user systems. There are amazing Zero Trust tools available to help make ongoing management of this much easier.

THE SAFEGUARDS

5.1 Establish and Maintain an Inventory of Accounts
Users | Identify | ● ○ ○ | ● ● ○ | ● ● ●

5.2 Use Unique Passwords
Users | Protect | ● ○ ○ | ● ● ○ | ● ● ●

5.3 Disable Dormant Accounts
Users | Respond | ● ○ ○ | ● ● ○ | ● ● ●

5.4 Restrict Administrator Privileges to Dedicated Administrator Accounts
Users | Protect | ● ○ ○ | ● ● ○ | ● ● ●

5.5 Establish and Maintain an Inventory of Service Accounts
Users | Identify | ○ ○ ○ | ● ● ○ | ● ● ●

5.6 Centralize Account Management
Users | Protect | ○ ○ ○ | ● ● ○ | ● ● ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

THE SAFEGUARDS

6.1 Establish an Access Granting Process
Users | Protect

6.2 Establish an Access Revoking Process
Users | Protect

6.3 Require MFA for Externally-Exposed Applications
Users | Protect

6.4 Require MFA for Remote Network Access
Users | Protect

6.5 Require MFA for Administrative Access
Users | Protect

6.6 Establish and Maintain an Inventory of Authentication and Authorization Systems
Users | Identify

6.7 Centralize Access Control
Users | Protect

6.8 Define and Maintain Role-Based Access Control
Data | Protect

1 2 3 4 5
Asset Type | Security Function

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

06 - Access Control Management

Safeguards Total 8 | IG1 5/8 | IG2 7/8 | IG3 8/8

Use processes and tools to create, assign, manage, and revoke access credentials and privileges for user, administrator, and service accounts for enterprise assets and software.

Why Is This CIS Control Critical?

Whereas CIS Control 5 deals specifically with account management, CIS Control 6 focuses on managing what access these accounts have, ensuring users only have access to the data or enterprise assets appropriate for their role, and ensuring that there is strong authentication for critical or sensitive enterprise data or functions.

Accounts should only have the minimal authorization needed for the role. Developing consistent access rights for each role and assigning roles to users is a best practice. Developing a program for complete provision and de-provisioning access is also important. Centralizing this function is ideal.

Did You Know?

In early November 2020, Microsoft urged users to stop using phone-based MFA and instead recommended using app-based authenticators and security keys. We can assist you to implement an organization-wide MFA system.

07 - Continuous Vulnerability Management

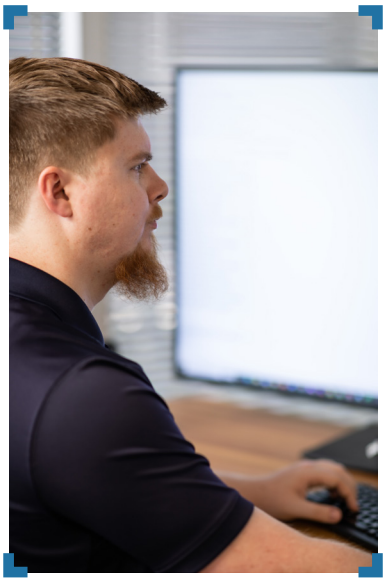
Safeguards Total	7	IG1	4/7	IG2	7/7	IG3	7/7

Develop a plan to continuously assess and track vulnerabilities on all enterprise assets within the enterprise's infrastructure in order to remediate and minimize the window of opportunity for attackers. Monitor public and private industry sources for new threat and vulnerability information.

Why Is This CIS Control Critical?

Attackers are constantly looking for vulnerabilities in their victims' infrastructures to exploit and gain access. Defenders must have timely threat information available to them about software updates, patches, security advisories, threat bulletins, etc., and they should regularly review their environment to identify these vulnerabilities before the attackers do. Understanding and managing vulnerabilities is a continuous activity requiring focus of time, attention, and resources.

Attackers have access to the same information and can often take advantage of vulnerabilities more quickly than an enterprise can remediate.



THE SAFEGUARDS

7.1 Establish and Maintain a Vulnerability Management Process
Applications | Protect

7.2 Establish and Maintain a Remediation Process
Applications | Respond

7.3 Perform Automated Operating System Patch Management
Applications | Protect

7.4 Perform Automated Application Patch Management
Applications | Protect

7.5 Perform Automated Vulnerability Scans of Internal Enterprise Assets
Applications | Identify

7.6 Perform Automated Vulnerability Scans of Externally-Exposed Enterprise Assets
Applications | Identify

7.7 Remediate Detected Vulnerabilities
Applications | Respond

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

Did You Know?

One of the main points of entry used by threat actors is to exploit unpatched vulnerabilities within systems. According to one survey from the Ponemon Institute, 60% of breaches in 2019 involved unpatched vulnerabilities.

08 - Audit Log Management

Safeguards Total 12 | IG1 3/12 | IG2 11/12 | IG3 12/12

Collect, alert, review, and retain audit logs of events that could help detect, understand, or recover from an attack.

Why Is This CIS Control Critical?

Log collection and analysis is critical for an enterprise's ability to detect malicious activity quickly. Sometimes audit records are the only evidence of a successful attack. Attackers know that many enterprises keep audit logs for compliance purposes but rarely analyze them. Attackers use this knowledge to hide their location, malicious software, and activities on victim machines. Due to poor or nonexistent log analysis processes in the target enterprise, attackers sometimes control victim machines for months or years without anyone knowing.

There are two types of logs that are generally treated and often configured independently: system logs and audit logs. System logs typically provide system-level events that show various system process start/end times, crashes, etc. These are native to systems, and take less configuration to turn on. Audit logs typically include user-level events—when a user logged in, accessed a file, etc.—and take more planning and effort to set up.

Logging records are also critical for incident response. After an attack has been detected, log analysis can help enterprises understand the extent of an attack. Complete logging records can show, for example, when and how the attack occurred, what information was accessed, and if data was exfiltrated. Retention of logs is also critical in case a follow-up investigation is required or if an attack remained undetected for a long period of time.

Did You Know?

Most businesses are legally obligated to have a data audit trail. Multiple government-mandated standards and regulations, including ISO 27001, PCI-DSS, HIPAA, PNR Directive, and more, require some form of audit trail. Talk to us today to help configure your auditing.

THE SAFEGUARDS

8.1 Establish and Maintain an Audit Log Management Process
Network | Protect | ● ○ ○

8.2 Collect Audit Logs
Network | Detect | ● ○ ○

8.3 Ensure Adequate Audit Log Storage
Network | Protect | ● ○ ○

8.4 Standardize Time Synchronization
Network | Protect | ○ ○ ○

8.5 Collect Detailed Audit Logs
Network | Detect | ○ ○ ○

8.6 Collect DNS Query Audit Logs
Network | Detect | ○ ○ ○

8.7 Collect URL Request Audit Logs
Network | Detect | ○ ○ ○

8.8 Collect Command-Line Audit Logs
Devices | Detect | ○ ○ ○

8.9 Centralize Audit Logs
Network | Detect | ○ ○ ○

8.10 Retain Audit Logs
Network | Protect | ○ ○ ○

8.11 Conduct Audit Log Reviews
Network | Detect | ○ ○ ○

8.12 Collect Service Provider Logs
Data | Detect | ○ ○ ○

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

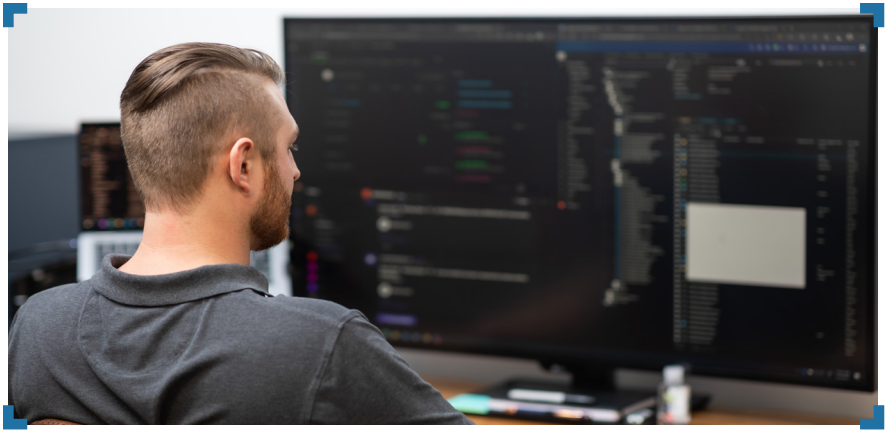
09 - Email and Web Browser Protections

Safeguards Total 7 | IG1 2/7 | IG2 6/7 | IG3 7/7

Improve protections and detections of threats from email and web vectors which are prime opportunities for attackers to manipulate human behavior through direct engagement.

Why Is This CIS Control Critical?

Web browsers and email clients are very common points of entry for attackers because of their direct interaction with users inside an enterprise. Content can be crafted to entice or spoof users into disclosing credentials, providing sensitive data, or providing an open channel to allow attackers to gain access, thus increasing risk to the enterprise. Since email and web are the main means that users interact with external and untrusted users and environments, these are prime targets for both malicious code and social engineering.



Did You Know?

The top malicious email attachment types are Office documents which make up 38%. The next highest is archive (.zip etc.) at 37%. A multi-layered approach to web and email protection is vital.

THE SAFEGUARDS

9.1 Ensure Use of Only Fully Supported Browsers and Email Clients
Applications | Protect

9.2 Use DNS Filtering Services
Network | Protect

9.3 Maintain and Enforce Network-Based URL Filters
Network | Protect

9.4 Restrict Unnecessary or Unauthorized Browser and Email Client Extensions
Applications | Protect

9.5 Implement DMARC
Network | Protect

9.6 Block Unnecessary File Types
Network | Protect

9.7 Deploy and Maintain Email Server Anti-Malware Protections
Network | Protect

1 2 3 4 5
Asset Type | Security Function

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

THE SAFEGUARDS

10.1 Deploy and Maintain Anti-Malware Software
Devices | Protect | ● ● ●

10.2 Configure Automatic Anti-Malware Signature Updates
Devices | Protect | ● ● ●

10.3 Disable Autorun and Autoplay for Removable Media
Devices | Protect | ● ● ●

10.4 Configure Automatic Anti-Malware Scanning of Removable Media
Devices | Detect | ○ ● ●

10.5 Enable Anti-Exploitation Features
Devices | Protect | ○ ● ●

10.6 Centrally Manage Anti-Malware Software
Devices | Protect | ○ ● ●

10.7 Use Behavior-Based Anti-Malware Software
Devices | Detect | ○ ● ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

10 - Malware Defenses

Safeguards Total 7 | IG1 3/7 | IG2 7/7 | IG3 7/7

Prevent or control the installation, spread, and execution of malicious applications, code, or scripts on enterprise assets.

Why Is This CIS Control Critical?

Malicious software (sometimes categorized as viruses or Trojans) is an integral and dangerous aspect of internet threats. They can have many purposes such as capturing credentials, stealing data, identifying other targets within the network, and encrypting or destroying data. Malware is ever-evolving and adaptive, as modern variants leverage machine learning techniques.

Malware enters an enterprise through vulnerabilities within the enterprise on end-user devices, email attachments, webpages, cloud services, mobile devices, and removable media. Malware often relies on insecure end-user behavior such as clicking links, opening attachments, installing software or profiles, or inserting Universal Serial Bus (USB) flash drives. Modern malware is designed to avoid, deceive, or disable defenses.

Did You Know?

Cyberattacks and threats are constantly evolving, with 350,000 new malware signatures detected every day. We can help you implement advanced enterprise level threat protection and detection tools that use technologies such as A.I. and machine learning.

11 - Data Recovery

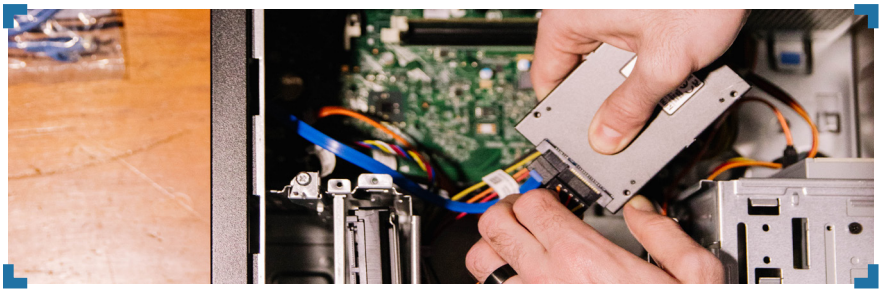
Safeguards Total 5 | IG1 4/5 | IG2 5/5 | IG3 5/5

Establish and maintain data recovery practices sufficient to restore in-scope enterprise assets to a pre-incident and trusted state.

Why Is This CIS Control Critical?

In the cybersecurity triad—Confidentiality, Integrity, and Availability (CIA)—the availability of data is, in some cases, more critical than its confidentiality. Enterprises need many types of data to make business decisions, and when that data is not available or is untrusted, it can impact the enterprise. An easy example is weather information required for a transportation enterprise.

When attackers compromise assets, they make changes to configurations, add accounts, and often add software or scripts. These changes are not always easy to identify, as attackers might have corrupted or replaced trusted applications with what appear to be standard-looking account names. Configuration changes can include adding or changing registry entries, opening ports, turning off security services, deleting logs, or other malicious actions that make a system insecure. These actions do not have to be malicious; human error can cause each of these as well. Therefore, it is important to have recent backups or mirrors to recover enterprise assets and data back to a known, trusted state.



Did You Know?

75% of small business owners don't have a disaster recovery plan in place. A basic disaster recovery plan can start off small and grow over time. Something is better than nothing. We can help you build a disaster recovery plan so you are ready when something happens.

THE SAFEGUARDS

11.1 Establish and Maintain a Data Recovery Process
Data | Recover | ● ○ ○

11.2 Perform Automated Backups
Data | Recover | ● ○ ○

11.3 Protect Recovery Data
Data | Protect | ● ○ ○

11.4 Establish and Maintain an Isolated Instance of Recovery Data
Data | Recover | ● ○ ○

11.5 Test Data Recovery
Data | Recover | ○ ○ ○

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

THE SAFEGUARDS

12.1 Ensure Network Infrastructure is Up-to-Date
Network | Protect | ● ● ●

12.2 Establish and Maintain a Secure Network Architecture
Network | Protect | ○ ● ●

12.3 Securely Manage Network Infrastructure
Network | Protect | ○ ● ●

12.4 Establish and Maintain Architecture Diagram(s)
Network | Identify | ○ ● ●

12.5 Centralize Network Authentication, Authorization, and Auditing (AAA)
Network | Protect | ○ ● ●

12.6 Use Secure Network Management and Communication Protocols
Network | Protect | ○ ● ●

12.7 Ensure Remote Devices Utilize a VPN and are Connecting to an Enterprise's AAA Infrastructure
Devices | Protect | ○ ● ●

12.8 Establish and Maintain Dedicated Computing Resources for All Administrative Work
Devices | Protect | ○ ○ ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

12 - Network Infrastructure Management

Safeguards Total 8 | IG1 1/8 | IG2 7/8 | IG3 8/8

Establish, implement, and actively manage (track, report, correct) network devices in order to prevent attackers from exploiting vulnerable network services and access points.

Why Is This CIS Control Critical?

Secure network infrastructure is an essential defense against attacks. This includes an appropriate security architecture, addressing vulnerabilities that are oftentimes introduced with default settings, monitoring for changes, and reassessment of current configurations. Network infrastructure includes devices such as physical and virtualized gateways, firewalls, wireless access points, routers, and switches.

Default configurations for network devices are geared for ease-of-deployment and ease-of-use—not security. Potential default vulnerabilities include open services and ports, default accounts and passwords (including service accounts), support for older vulnerable protocols, and pre-installation of unneeded software. Attackers search for vulnerable default settings, gaps, or inconsistencies in firewall rule sets, routers, and switches and use those holes to penetrate defenses.

They exploit flaws in these devices to gain access to networks, redirect traffic on a network, and intercept data while in transmission.

Network security is a constantly changing environment that necessitates regular re-evaluation of architecture diagrams, configurations, access controls, and allowed traffic flows. As users demand exceptions for specific business needs, attackers take advantage of network device configurations becoming less secure over time.

Did You Know?

Research from Gartner suggested that, through 2022, 99% of firewall breaches would be caused by simple firewall misconfigurations. Regular and ongoing network configuration monitoring and audits can help pick up any weak points. We can work with you to develop a plan.

13 - Network Monitoring and Defense

Safeguards Total 11 | IG1 0/11 | IG2 6/11 | IG3 11/11

Operate processes and tooling to establish and maintain comprehensive network monitoring and defense against security threats across the enterprise's network infrastructure and user base.

Why Is This CIS Control Critical?

We cannot blindly rely on network defenses to be perfect. Cybercriminals continue to improve their attack capabilities and craft new ways to bypass security controls. Even if security tools work "as advertised," it takes an understanding of the enterprise risk posture to configure, tune, and log them to be effective. Often, misconfigurations due to human error or lack of knowledge of tool capabilities give enterprises a false sense of security.

Security tools can only be effective if they are supporting a process of ongoing monitoring that allows staff the ability to be alerted and respond to security incidents quickly. Enterprises that adopt a purely technology-driven approach will also experience more false positives due to their over-reliance on alerts from tools. Identifying and responding to these threats requires visibility into all threat vectors of the infrastructure and leveraging humans in the process of detection, analysis, and response. It is critical for large or heavily targeted enterprises to have a security operations capability to prevent, detect, and quickly respond to cyberthreats before they can impact the enterprise.

Did You Know?

In the first half of 2019, 4.1 billion data records were compromised from 3,800 publicly disclosed data breaches. The reputational damage from a data leak can often be the most costly part of all, greatly increasing the risk of a business shutting down after a breach.

THE SAFEGUARDS

13.1 Centralize Security Event Alerting
Network | Detect | ● ●

13.2 Deploy a Host-Based Intrusion Detection Solution
Devices | Detect | ● ●

13.3 Deploy a Network Intrusion Detection Solution
Network | Detect | ● ●

13.4 Perform Traffic Filtering Between Network Segments
Network | Protect | ● ●

13.5 Manage Access Control for Remote Assets
Devices | Protect | ● ●

13.6 Collect Network Traffic Flow Logs
Network | Detect | ● ●

13.7 Deploy a Host-Based Intrusion Prevention Solution
Devices | Protect | ●

13.8 Deploy a Network Intrusion Prevention Solution
Network | Protect | ●

13.9 Deploy Port-Level Access Control
Devices | Protect | ●

13.10 Perform Application Layer Filtering
Network | Protect | ●

13.11 Tune Security Event Alerting Thresholds
Network | Detect | ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

THE SAFEGUARDS

14.1 Establish and Maintain a Security Awareness Program
N/A Protect ● ● ●

14.2 Train Workforce Members to Recognize Social Engineering Attacks
N/A Protect ● ● ●

14.3 Train Workforce Members on Authentication Best Practices
N/A Protect ● ● ●

14.4 Train Workforce on Data Handling Best Practices
N/A Protect ● ● ●

14.5 Train Workforce Members on Causes of Unintentional Data Exposure
N/A Protect ● ● ●

14.6 Train Workforce Members on Recognizing and Reporting Security Incidents
N/A Protect ● ● ●

14.7 Train Workforce on How to Identify and Report if Their Enterprise Assets are Missing Security Updates
N/A Protect ● ● ●

14.8 Train Workforce on the Dangers of Connecting to and Transmitting Enterprise Data Over Insecure Networks
N/A Protect ● ● ●

14.9 Conduct Role-Specific Security Awareness and Skills Training
N/A Protect ○ ● ●

1 2 3 4 5
Asset Type Security Function ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

14 - Security Awareness and Skills Training

Safeguards Total 9 | IG1 8/9 | IG2 9/9 | IG3 9/9

Establish and maintain a security awareness program to influence behavior among the workforce to be security conscious and properly skilled to reduce cybersecurity risks to the enterprise.

Why Is This CIS Control Critical?

The actions of people play a critical part in the success or failure of an enterprise's security program. It is easier for an attacker to entice a user to click a link or open an email attachment to install malware in order to get into an enterprise than to find a network exploit to do it directly.

Users themselves, both intentionally and unintentionally, can cause incidents as a result of mishandling sensitive data, sending an email with sensitive data to the wrong recipient, losing a portable end-user device, using weak passwords, or using the same password they use on public sites.

No security program can effectively address cyberrisk without a means to address this fundamental human vulnerability. Users at every level of the enterprise have different risks. For example: executives manage more sensitive data; system administrators have the ability to control access to systems and applications; and users in finance, human resources, and contracts all have access to different types of sensitive data that can make them targets.

Training should be updated regularly.

Did You Know?

90% of U.S. organizations required or requested most of their users to work from home in 2020; however, only 29% trained their employees about best practices for working remotely. We can get your team access to some of the best end-user cybersecurity training available.

15 - Service Provider Management

Safeguards Total 7 | IG1 1/7 | IG2 4/7 | IG3 7/7

Develop a process to evaluate service providers who hold sensitive data or are responsible for an enterprise's critical IT platforms or processes to ensure these providers are protecting those platforms and data appropriately.

Why Is This CIS Control Critical?

In our modern, connected world, enterprises rely on vendors and partners to help manage their data or rely on third-party infrastructure for core applications or functions.

There have been numerous examples where third-party breaches have significantly impacted an enterprise; for example, as early as the late 2000s, payment cards were compromised after attackers infiltrated smaller third-party vendors in the retail industry. More recent examples include ransomware attacks that have impacted enterprises indirectly due to service providers being locked down, causing disruptions to business.

Even worse, if directly connected, a ransomware attack could encrypt data on the main enterprise.

Did You Know?

Many cyberattacks originate through 3rd-party vendors and software, so it's important to make sure you do due diligence whenever you pick a new vendor to work with. We can help you through the vetting process when selecting new vendors so you know what security questions to ask.

THE SAFEGUARDS

15.1 Establish and Maintain an Inventory of Service Providers
N/A | Identify | ● ● ●

15.2 Establish and Maintain a Service Provider Management Policy
N/A | Identify | ○ ● ●

15.3 Classify Service Providers
N/A | Identify | ○ ● ●

15.4 Ensure Service Provider Contracts Include Security Requirements
N/A | Protect | ○ ● ●

15.5 Assess Service Providers
N/A | Identify | ○ ○ ●

15.6 Monitor Service Providers
Data | Detect | ○ ○ ●

15.7 Securely Decommission Service Providers
Data | Protect | ○ ○ ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

THE SAFEGUARDS

16.1 Establish and Maintain a Secure Application Development Process
Applications Protect

16.2 Establish and Maintain a Process to Accept and Address Software Vulnerabilities
Applications Protect

16.3 Perform Root Cause Analysis on Security Vulnerabilities
Applications Protect

16.4 Establish and Manage an Inventory of Third-Party Software Components
Applications Protect

16.5 Use Up-to-Date and Trusted Third-Party Software Components
Applications Protect

16.6 Establish and Maintain a Severity Rating System and Process for Application Vulnerabilities
Applications Protect

16.7 Use Standard Hardening Configuration Templates for Application Infrastructure
Applications Protect

16.8 Separate Production and Non-Production Systems
Applications Protect

16.9 Train Developers in Application Security Concepts and Secure Coding
Applications Protect

16.10 Apply Secure Design Principles in Application Architectures
Applications Protect

16.11 Leverage Vetted Modules or Services for Application Security Components
Applications Protect

16.12 Implement Code-Level Security Checks
Applications Protect

16.13 Conduct Application Penetration Testing
Applications Protect

16.14 Conduct Threat Modeling
Applications Protect

16 - Application Software Security

Safeguards Total 14 | IG1 0/14 | IG2 11/14 | IG3 14/14

Manage the security life cycle of in-house developed, hosted, or acquired software to prevent, detect, and remediate security weaknesses before they can impact the enterprise.

Why Is This CIS Control Critical?

Applications provide a human-friendly interface to allow users to access and manage data in a way that is aligned to business functions. They also minimize the need for users to deal directly with complex (and potentially error-prone) system functions like logging into a database to insert or modify files. Enterprises use applications to manage their most sensitive data and control access to system resources.

Therefore, an attacker can use the application itself to compromise the data instead of an elaborate network and system hacking sequence that attempts to bypass network security controls and sensors. This is why protecting user credentials (specifically application credentials) defined in CIS Control 6 is so important.

17 - Incident Response Management

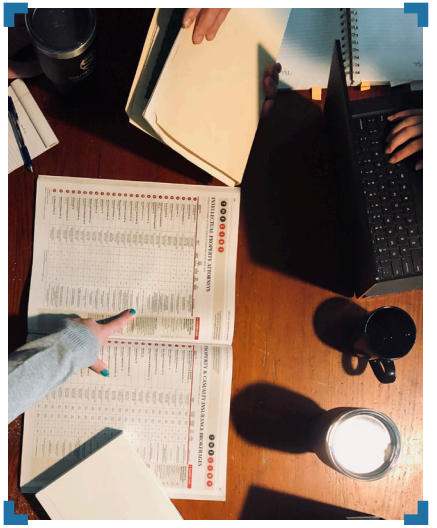
Safeguards Total 9 | IG1 3/9 | IG2 8/9 | IG3 9/9

Establish a program to develop and maintain an incident response capability (e.g., policies, plans, procedures, defined roles, training, and communications) to prepare, detect, and quickly respond to an attack.

Why Is This CIS Control Critical?

A comprehensive cybersecurity program includes protections, detections, responses, and recovery capabilities. Often, the final two get overlooked in immature enterprises, or the response technique to compromised systems is just to re-image them to original state and move on. The primary goal of incident response is to identify threats on the enterprise, respond to them before they can spread, and remediate them before they can cause harm. Without understanding the full scope of an incident, how it happened, and what can be done to prevent it from happening again, defenders will find themselves in a vicious cycle.

We cannot expect our protections to be effective 100% of the time. When an incident occurs, if an enterprise does not have a documented plan, it is almost impossible to know the right investigative procedures, reporting, data collection, management responsibility, legal protocols, and communications strategy that will allow the enterprise to be successful in understanding, managing, and recovering-even when that enterprise is staffed with good people.



Did You Know?

65% of small businesses have failed to act following a cybersecurity incident. Equally alarming, only 23% of small businesses have a leadership role dedicated to cybersecurity, whereas 46% have no defined role at all. We have a security incident response process in place to assist you if ever needed.

THE SAFEGUARDS

17.1 Designate Personnel to Manage Incident Handling
N/A | Respond | ● ○ ○

17.2 Establish and Maintain Contact Information for Reporting Security Incidents
N/A | Respond | ● ○ ○

17.3 Establish and Maintain an Enterprise Process for Reporting Incidents
N/A | Respond | ● ○ ○

17.4 Establish and Maintain an Incident Response Process
N/A | Respond | ○ ○ ○

17.5 Assign Key Roles and Responsibilities
N/A | Respond | ○ ○ ○

17.6 Define Mechanisms for Communicating During Incident Response
N/A | Respond | ○ ○ ○

17.7 Conduct Routine Incident Response Exercises
N/A | Recover | ○ ○ ○

17.8 Conduct Post-Incident Reviews
N/A | Recover | ○ ○ ○

17.9 Establish and Maintain Security Incident Thresholds
N/A | Recover | ○ ○ ○

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

THE SAFEGUARDS

18.1 Establish and Maintain a Penetration Testing Program
N/A | Identify | ● ●

18.2 Perform Periodic External Penetration Tests
Network | Identify | ● ●

18.3 Remediate Penetration Test Findings
Network | Protect | ● ●

18.4 Validate Security Measures
Network | Protect | ●

18.5 Perform Periodic Internal Penetration Tests
N/A | Identify | ●

1 2 3 4 5
Asset Type | Security Function | ● ● ●

1= Asset Type
2= Security Function
3= Implementation Group 1
4= Implementation Group 2
5= Implementation Group 3

18 - Penetration Testing

Safeguards Total 5 | IG1 0/5 | IG2 3/5 | IG3 5/5

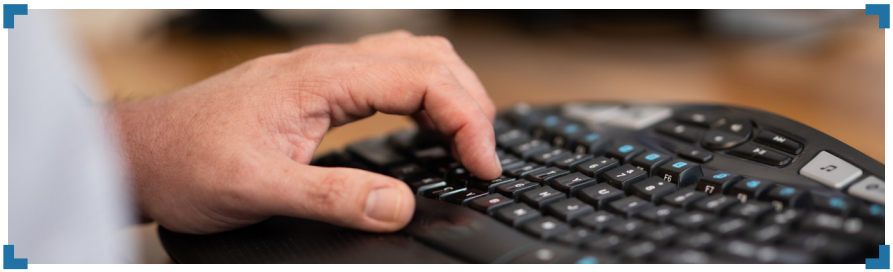
Test the effectiveness and resiliency of enterprise assets through identifying and exploiting weaknesses in controls (people, processes, and technology), and simulating the objectives and actions of an attacker.

Why Is This CIS Control Critical?

A successful defensive posture requires a comprehensive program of effective policies and governance, strong technical defenses, and appropriate action from people. However, it is rarely perfect. In a complex environment where technology is constantly evolving and new attacker tradecraft appears regularly, enterprises should periodically test their controls to identify gaps and assess their resiliency. This test may be from external network, internal network, application, system, or device perspective. It may include social engineering of users or physical access control bypasses.

Often, penetration tests are performed for specific purposes:

- As a "dramatic" demonstration of an attack, usually to convince decision-makers of their enterprise's weaknesses
- As a means to test the correct operation of enterprise defenses (verification)
- To test that the enterprise has built the right defenses in the first place (validation)



Did You Know?

As sophisticated as security devices are today, almost 90% of cyberattacks are caused by human error or behavior. Penetration testing can help improve the overall security posture of an organization. We can simulate common attacks to help you find potential weak points.

HOW WE CAN HELP

WE CAN HELP!

We can help you navigate the complicated world of IT & cybersecurity so you can better protect your data and your business.

TALK TO US TODAY

(813) 229-1700

info@sterlingideas.com

sterlingideas.com

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Sources & Attribution:

All statistics are from the following sources unless otherwise mentioned:

- PurpleSec 2021 Cybersecurity Statistics
- Verizon 2019 Data Breach Investigations Report
- Cyber Rescue Alliance - Cyber Insights of 2021 Report
- FBI 2020 IC3 Annual Report

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