The below entities collaborated in the creation of this guide. This does not constitute or imply an endorsement by the FCC of any commercial product, service or enterprise of these entities. This guide is not a substitute for consulting trained cyber security professionals.
Thank you for using the FCC’s Small Biz Cyber Planner, a tool for small businesses to create customized cyber security planning guides. Businesses large and small need to do more to protect against growing cyber threats. As larger companies take steps to secure their systems, less secure small businesses are easier targets for cyber criminals.

This planning guide is designed to meet the specific needs of your company, using the FCC’s customizable Small Biz Cyber Planner tool. The tool is designed for businesses that lack the resources to hire dedicated staff to protect their business, information and customers from cyber threats. Even a business with one computer or one credit card terminal can benefit from this important tool. We generally recommend that businesses using more sophisticated networks with dozens of computers consult a cyber security expert in addition to using the cyber planner. The FCC provides no warranties with respect to the guidance provided by this tool and is not responsible for any harm that might occur as a result of or in spite of its use.

The guidance was developed by the FCC with input from public and private sector partners, including the Department of Homeland Security, the National Cyber Security Alliance and The Chamber of Commerce.

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Securing your company’s network consists of: (1) identifying all devices and connections on the network; (2) setting boundaries between your company’s systems and others; and (3) enforcing controls to ensure that unauthorized access, misuse, or denial-of-service events can be thwarted or rapidly contained and recovered from if they do occur.

**Cyber Plan Action Items:**

1. **Secure internal network and cloud services**

Your company’s network should be separated from the public Internet by strong user authentication mechanisms and policy enforcement systems such as firewalls and web filtering proxies. Additional monitoring and security solutions, such as anti-virus software and intrusion detection systems, should also be employed to identify and stop malicious code or unauthorized access attempts.

*Internal network*

After identifying the boundary points on your company’s network, each boundary should be evaluated to determine what types of security controls are necessary and how they can be best deployed. Border routers should be configured to only route traffic to and from your company’s public IP addresses, firewalls should be deployed to restrict traffic only to and from the minimum set of necessary services, and intrusion prevention systems should be configured to monitor for suspicious activity crossing your network perimeter. In order to prevent bottlenecks, all security systems you deploy to your company’s network perimeter should be capable of handling the bandwidth that your carrier provides.

*Cloud based services*

Carefully consult your terms of service with all cloud service providers to ensure that your company’s information and activities are protected with the same degree of security you would intend to provide on your own. Request security and auditing from your cloud service providers as applicable to your company’s needs and concerns. Review and understand service level agreements, or SLAs, for system restoration and reconstitution time.

You should also inquire about additional services a cloud service can provide. These services may include backup-and-restore services and encryption services, which may be very attractive to small businesses.

2. **Develop strong password policies**

Generally speaking, two-factor authentication methods, which require two types of evidence that you are who you claim to be, are safer than using just static passwords for authentication. One common example is a personal security token that displays changing passcodes to be used in conjunction with an established password. However, two-factor systems may not always be possible or practical for your company.

Password policies should encourage your employees to employ the strongest passwords possible without creating the need or temptation to reuse passwords or write them down. That means passwords that are random, complex and long (at least 10 characters), that are changed regularly, and that are closely guarded by those who know them.
3. Secure and encrypt your company’s Wi-Fi

*Wireless access control*

Your company may choose to operate a Wireless Local Area Network (WLAN) for the use of customers, guests and visitors. If so, it is important that such a WLAN be kept separate from the main company network so that traffic from the public network cannot traverse the company’s internal systems at any point.

Internal, non-public WLAN access should be restricted to specific devices and specific users to the greatest extent possible while meeting your company’s business needs. Where the internal WLAN has less stringent access controls than your company’s wired network, dual connections -- where a device is able to connect to both the wireless and wired networks simultaneously -- should be prohibited by technical controls on each such capable device (e.g., BIOS-level LAN/WLAN switch settings). All users should be given unique credentials with preset expiration dates to use when accessing the internal WLAN.

*Wireless encryption*

Due to demonstrable security flaws known to exist in older forms of wireless encryption, your company’s internal WLAN should only employ Wi-Fi Protected Access 2 (WPA2) encryption.

4. Encrypt sensitive company data

Encryption should be employed to protect any data that your company considers sensitive, in addition to meeting applicable regulatory requirements on information safeguarding. Different encryption schemes are appropriate under different circumstances. However, applications that comply with the OpenPGP standard, such as PGP and GnuPG, provide a wide range of options for securing data on disk as well as in transit. If you choose to offer secure transactions via your company’s website, consult with your service provider about available options for an SSL certificate for your site.

5. Regularly update all applications

All systems and software, including networking equipment, should be updated in a timely fashion as patches and firmware upgrades become available. Use automatic updating services whenever possible, especially for security systems such as anti-malware applications, web filtering tools and intrusion prevention systems.

6. Set safe web browsing rules

Your company’s internal network should only be able to access those services and resources on the Internet that are essential to the business and the needs of your employees. Use the safe browsing features included with modern web browsing software and a web proxy to ensure that malicious or unauthorized sites cannot be accessed from your internal network.

7. If remote access is enabled, make sure it is secure

If your company needs to provide remote access to your company’s internal network over the Internet, one popular and secure option is to employ a secure Virtual Private Network (VPN) system accompanied by strong two-factor authentication, using either hardware or software tokens.

8. Create Safe-Use Flash Drive Policy

Ensure employees never put any unknown flash drive or USBs into their computer. As the U.S. Chamber’s *Internet Security Essentials for Business 2.0* states, small businesses should set a policy so that employees know they should...
never open a file from a flash drive they are not familiar with and should hold down the Shift key when inserting the flash drive to block malware.

Helpful links

- Philip Zimmerman, Where to Get PGP: http://philzimmermann.com/EN/findpgp/
Adware
Any software application that displays advertising banners while the program is running. Adware often includes code that tracks a user’s personal information and passes it on to third parties without the user’s authorization or knowledge. And if you gather enough of it, adware slows down your computer significantly. Over time, performance can be so degraded that you may have trouble working productively. See also Spyware and Malware.

Anti-Virus Software
Software designed to detect and potentially eliminate viruses before they have had a chance to wreak havoc within the system. Anti-virus software can also repair or quarantine files that have already been infected by virus activity. See also Virus and Electronic Infections.

Application
Software that performs automated functions for a user, such as word processing, spreadsheets, graphics, presentations and databases—as opposed to operating system (OS) software.

Attachment
A file that has been added to an email—often an image or document. It could be something useful to you or something harmful to your computer. See also Virus.

Authentication
Confirming the correctness of the claimed identity of an individual user, machine, software component or any other entity.

Authorization
The approval, permission or empowerment for someone or something to do something.

Backdoor
Hidden software or hardware mechanism used to circumvent security controls.

Backup
File copies that are saved as protection against loss, damage or unavailability of the primary data. Saving methods include high-capacity tape, separate disk sub-systems or on the Internet. Off-site backup storage is ideal, sufficiently far away to reduce the risk of environmental damage such as flood, which might destroy both the primary and the backup if kept nearby.

Badware
See Malware, Adware and Spyware.
Bandwidth
The capacity of a communication channel to pass data such as text, images, video or sound through the channel in a given amount of time. Usually expressed in bits per second.

Blacklisting Software
A form of filtering that blocks only websites specified as harmful. Parents and employers sometimes use such software to prevent children and employees from visiting certain websites. You can add and remove sites from the “not permitted” list. This method of filtering allows for more full use of the Internet, but is less efficient at preventing access to any harmful material that is not on the list. See also Whitelisting Software.

Blended Threat
A computer network attack that seeks to maximize the severity of damage and speed of contagion by combining methods—for example, using characteristics of both viruses and worms. See also Electronic Infection.

Blog
Short for “Web log,” a blog is usually defined as an online diary or journal. It is usually updated frequently and offered in a dated log format with the most recent entry at the top of the page. It often contains links to other websites along with commentary about those sites or specific subjects, such as politics, news, pop culture or computers.

Broadband
General term used to refer to high-speed network connections such as cable modem and Digital Subscriber Line (DSL). These types of “always on” Internet connections are actually more susceptible to some security threats than computers that access the Web via dial-up service.

Browser
A client software program that can retrieve and display information from servers on the World Wide Web. Often known as a “Web browser” or “Internet browser.” Examples include Microsoft’s Internet Explorer, Google’s Chrome, Apple’s Safari, and Mozilla’s Firefox.

Brute Force Attack
An exhaustive password-cracking procedure that tries all possibilities, one by one. See also Dictionary Attack and Hybrid Attack.

Clear Desk Policy
A policy that directs all personnel to clear their desks at the end of each working day, and file everything appropriately. Desks should be cleared of all documents and papers, including the contents of the “in” and “out” trays—not simply for cleanliness, but also to ensure that sensitive papers and documents are not exposed to unauthorized persons outside of working hours.
Clear Screen Policy
A policy that directs all computer users to ensure that the contents of the screen are protected from prying eyes and opportunistic breaches of confidentiality. Typically, the easiest means of compliance is to use a screen saver that engages either on request or after a specified short period of time. See also Shoulder Surfing.

Cookie
A small file that is downloaded by some websites to store a packet of information on your browser. Companies and organizations use cookies to remember your login or registration identification, site preferences, pages viewed and online “shopping-cart” so that the next time you visit a site, your stored information can automatically be pulled up for you. A cookie is obviously convenient but also presents potential security issues. You can configure your browser to alert you whenever a cookie is being sent. You can refuse to accept all cookies or erase all cookies saved on your browser.

Credit Card
A card indicating the holder has been granted a line of credit. Often sought after by criminals looking for an easy way to purchase things without having to pay for them. For this reason and others, a credit card preferable to a debit card for online shopping since it provides a buffer between buyer and seller, affording more protections to the buyer in case there is a problem with the order or the card number is compromised. See also Debit Card.

Cyberbullying
Sending or posting harmful, cruel, rude or threatening messages, or slanderous information, text or images using the Internet or other digital communication devices.

Debit Card
A card linked directly to the holder’s bank account, withdrawing money from the account. Not as safe as credit cards for online shopping since if problems arise, the buyer’s money has already been spent and is harder to get back. See also Credit Card.

Denial of Service Attack
The prevention of authorized access to a system resource or the delaying of system operations and functions. Often this involves a cyber criminal generating a large volume of data requests. See also Flooding.

Dictionary Attack
A password-cracking attack that tries all of the phrases or words in a dictionary. See also Brute Force Attack and Hybrid Attack.
Digital Certificate
The electronic equivalent of an ID card that establishes your credentials when doing business or other transactions on the Web. It contains your name, a serial number, expiration dates, a copy of the certificate holder’s public key (used for encrypting messages and digital signatures) and the digital signature of the certificate-issuing authority so that a recipient can verify that the certificate is real.

Domain Hijacking
An attack in which an attacker takes over a domain by first blocking access to the domain’s DNS server and then putting his own server up in its place.

Domain Name System (DNS)
The DNS is the way that Internet domain names are located. A website’s domain name is easier to remember than its IP (Internet Protocol) address.

Dumpster Diving
Recovering files, letters, memos, photographs, IDs, passwords, checks, account statements, credit card offers and more from garbage cans and recycling bins. This information can then be used to commit identity theft.

Electronic Infections
Often called “viruses,” these malicious programs and codes harm your computer and compromise your privacy. In addition to the traditional viruses, other common types include worms and Trojan horses. They sometimes work in tandem to do maximum damage. See also Blended Threat.

Encryption
A data security technique used to protect information from unauthorized inspection or alteration. Information is encoded so that it appears as a meaningless string of letters and symbols during delivery or transmission. Upon receipt, the information is decoded using an encryption key.

End User License Agreement (EULA)
A contract between you and your software’s vendor or developer. Many times, the EULA is presented as a dialog box that appears the first time you open the software and forces you to check “I accept” before you can proceed. Before accepting, though, read through it and make sure you understand and are comfortable with the terms of the agreement. If the software’s EULA is hard to understand or you can’t find it, beware!

Evil Twins
A fake wireless Internet hot spot that looks like a legitimate service. When victims connect to the wireless network, a hacker can launch a spying attack on their transactions on the Internet, or just ask for credit card information in the standard pay-for-access deal. See also Man-in-the-Middle Attacks.
**File-Sharing Programs**
Sometimes called peer-to-peer (P2P) programs, these allow many different users to access the same file at the same time. These programs are often used to illegally upload and download music and other software. Examples include Napster, Grokster, Kazaa, iMesh, Ares and Limewire.

**Firewall**
A hardware or software link in a network that inspects all data packets coming and going from a computer, permitting only those that are authorized to reach the other side.

**Flooding**
An attack that attempts to cause a failure in the security of a computer by providing more input, such as a large volume of data requests, than it can properly process. See also Denial of Service Attack.

**Grooming**
Using the Internet to manipulate and gain trust of a minor as a first step towards the future sexual abuse, production or exposure of that minor. Sometimes involves developing the child’s sexual awareness and may take days, weeks, months or in some cases years to manipulate the minor.

**Hacker**
An individual who attempts to break into a computer without authorization.

**HTTPS**
When used in the first part of a URL (e.g., http://), this term specifies the use of hypertext transfer protocol (HTTP) enhanced by a security mechanism such as Secure Socket Layer (SSL). Always look for the HTTPS on the checkout or order form page when shopping online or when logging into a site and providing your username and password.

**Hybrid Attack**
Builds on other password-cracking attacks by adding numerals and symbols to dictionary words. See also Dictionary Attack and Brute Force Attack.

**Instant Messaging (IM)**
A service that allows people to send and get messages almost instantly. To send messages using instant messaging you need to download an instant messaging program and know the instant messaging address of another person who uses the same IM program. See also Spim.

**IP (Internet Protocol) Address**
A computer’s inter-network address, written as a series of four 8-bit numbers separated by periods, such as 123.45.678.990. Every website has an IP Address, although finding a website is considerably easier to do when using its domain name instead. See also Domain Name System (DNS).
Internet Service Provider (ISP)
A company that provides internet access to customers.

Keystroke Logger
A specific type of electronic infection that records victims’ keystrokes and sends them to an attacker. This can be done with either hardware or software. See also Trojan Horse.

Malware
A generic term for a number of different types of malicious code. See also Adware and Spyware.

Man-In-the-Middle Attack
Posing as an online bank or merchant, a cyber criminal allows a victim to sign in over a Secure Sockets Layer (SSL) connection. The attacker then logs onto the real server using the client’s information and steals credit card numbers.

Monitoring Software
Software products that allow parents to monitor or track the websites or email messages that a child visits or reads. See also Blacklisting Software and Whitelisting Software.

Network
Two or more computer systems that are grouped together to share information, software and hardware.

Operating System (OS)
Programs that manage all the basic functions and programs on a computer, such as allocating system resources, providing access and security controls, maintaining file systems and managing communications between end users and hardware devices. Examples include Microsoft’s Windows, Apple’s Macintosh and Red Hat’s Linux.

Password
A secret sequence of characters that is used as a means of authentication to confirm your identity in a computer program or online.

Password Cracking
Password cracking is the process of attempting to guess passwords, given the password file information. See also Brute Force Attacks, Dictionary Attacks and Hybrid Attacks.

Password Sniffing
Passive wiretapping, usually on a local area network, to gain knowledge of passwords.
Patch
A patch is a small security update released by a software manufacturer to fix bugs in existing programs. Your computer’s software programs and/or operating system may be configured to check automatically for patches, or you may need to periodically visit the manufacturers’ websites to see if there have been any updates.

Peer-to-Peer (P2P) Programs
See File-Sharing Programs.

Phishing
Soliciting private information from customers or members of a business, bank or other organization in an attempt to fool them into divulging confidential personal and financial information. People are lured into sharing user names, passwords, account information or credit card numbers, usually by an official-looking message in an email or a pop-up advertisement that urges them to act immediately, usually by clicking on a link provided. See also Vishing.

Pharming
Redirecting visitors from a real website to a bogus one. A user enters what is believed to be a valid Web address and is unknowingly redirected to an illegitimate site that steals the user's personal information. On the spoofed site, criminals may mimic real transactions and harvest private information unknowingly shared by users. With this, the attacker can then access the real website and conduct transactions using the credentials of a valid user.

Router
A hardware device that connects two or more networks and routes incoming data packets to the appropriate network. Many Internet Service Providers (ISPs) provide these devices to their customers, and they often contain firewall protections.

Script
A file containing active content -- for example, commands or instructions to be executed by the computer.

Shoulder Surfing
Looking over a person’s shoulder to get confidential information. It is an effective way to get information in crowded places because it’s relatively easy to stand next to someone and watch as they fill out a form, enter a PIN number at an ATM machine or type a password. Can also be done long-distance with the aid of binoculars or other vision-enhancing devices. To combat it, experts recommend that you shield paperwork or your keypad from view by using your body or cupping your hand. Also, be sure you password-protect your computer screen when you must leave it unattended, and clear your desk at the end of the day. See also Clear Desk Policy and Clear Screen Policy.
Skimming
A high-tech method by which thieves capture your personal or account information from your credit card, driver’s license or even passport using an electronic device called a “skimmer.” Such devices can be purchased online for under $50. Your card is swiped through the skimmer and the information contained in the magnetic strip on the card is then read into and stored on the device or an attached computer. Skimming is predominantly a tactic used to perpetuate credit card fraud, but is also gaining in popularity amongst identity thieves.

Social Engineering
A euphemism for non-technical or low-technology means—such as lies, impersonation, tricks, bribes, blackmail and threats—used to attack information systems. Sometimes telemarketers or unethical employees employ such tactics.

Social Networking Websites
Sites specifically focused on the building and verifying of social networks for whatever purpose. Many social networking services are also blog hosting services. There are more than 300 known social networking websites, including Facebook, MySpace, Friendster, Xanga and Blogspot. Such sites enable users to create online profiles and post pictures and share personal data such as their contact information, hobbies, activities and interests. The sites facilitate connecting with other users with similar interests, activities and locations. Sites vary in who may view a user’s profile—some have settings which may be changed so that profiles can be viewed only by “friends.” See also Blogs.

Spam
Unwanted, unsolicited email from someone you don’t know. Often sent in an attempt to sell you something or get you to reveal personal information.

Spim
Unwanted, unsolicited instant messages from someone you don’t know. Often sent in an attempt to sell you something or get you to reveal personal information.

Spoofing
Masquerading so that a trusted IP address is used instead of the true IP address. A technique used by hackers as a means of gaining access to a computer system.

Spyware
Software that uses your Internet connection to send personally identifiable information about you to a collecting device on the Internet. It is often packaged with software that you download voluntarily, so that even if you remove the downloaded program later, the spyware may remain. See also Adware and Malware.

SSL (Secure Socket Layer)
An encryption system that protects the privacy of data exchanged by a website and the individual user. Used by websites whose URLs begin with https instead of http.
Trojan Horse
A computer program that appears to be beneficial or innocuous, but also has a hidden and potentially malicious function that evades security mechanisms. A “keystroke logger,” which records victims’ keystrokes and sends them to an attacker, or remote-controlled “zombie computers” are examples of the damage that can be done by Trojan horses. See also Electronic Infection.

URL
Abbreviation for “Uniform (or Universal) Resource Locator.” A way of specifying the location of publicly available information on the Internet. Also known as a Web address.

URL Obfuscation
Taking advantage of human error, some scammers use phishing emails to guide recipients to fraudulent sites with names very similar to established sites. They use a slight misspelling or other subtle difference in the URL, such as “monneybank.com” instead of “moneybank.com” to redirect users to share their personal information unknowingly.

Virus
A hidden, self-replicating section of computer software, usually malicious logic, that propagates by infecting—i.e., inserting a copy of itself into and becoming part of -- another program. A virus cannot run by itself; it requires that its host program be run to make the virus active. Often sent through email attachments. Also see Electronic Infection and Blended Threat.

Vishing
Soliciting private information from customers or members of a business, bank or other organization in an attempt to fool them into divulging confidential personal and financial information. People are lured into sharing user names, passwords, account information or credit card numbers, usually by an official-looking message in an email or a pop-up advertisement that urges them to act immediately—but in a vishing scam, they are urged to call the phone number provided rather than clicking on a link. See also Phishing.

Vulnerability
A flaw that allows someone to operate a computer system with authorization levels in excess of that which the system owner specifically granted.

Whitelisting Software
A form of filtering that only allows connections to a pre-approved list of sites that are considered useful and appropriate for children. Parents sometimes use such software to prevent children from visiting all but certain websites. You can add and remove sites from the “permitted” list. This method is extremely safe, but allows for only extremely limited use of the Internet.
Worm
Originally an acronym for “Write once, read many times,” a type of electronic infection that can run independently, can propagate a complete working version of itself onto other hosts on a network, and may consume computer resources destructively. Once this malicious software is on a computer, it scans the network for another machine with a specific security vulnerability. When it finds one, it exploits the weakness to copy itself to the new machine, and then the worm starts replicating from there, as well. See also Electronic Infection and Blended Threat.

Zombie Computer
A remote-access Trojan horse installs hidden code that allows your computer to be controlled remotely. Digital thieves then use robot networks of thousands of zombie computers to carry out attacks on other people and cover up their tracks. Authorities have a harder time tracing criminals when they go through zombie computers.

Sources:

National Institute of Standards and Technology:
http://nvlpubs.nist.gov/nistpubs/ir/2013/NIST.IR.7298r2.pdf
Cyber Security Links

Cyber Security and Privacy Protection

- Center for Internet Security (CIS):
  www.cisecurity.org

- Free online security check ups:
  http://www.staysafeonline.org/stay-safe-online/free-security-check-ups

- National Cyber Security Alliance for Small Business Home Users:
  http://www.staysafeonline.org

- OnGuard Online:
  www.OnGuardOnline.gov

- SANS (SysAdmin, Audit, Network, Security) Institute’s Most Critical Internet Security Vulnerabilities:
  www.sans.org/top20

- Security Tips from Securing our eCity:
  http://securingourecity.org/

- Small Business Solutions form StopBadware:
  http://stopbadware.org/

- The Open Web Application Security Project:
  www.owasp.org

Cyber Security Threat Centers

- Cyber Safety Links for High School Students

- McAfee Security Solutions for Small Business:

- Symantec Security Solutions for Small Business:
  http://store.symantec.com/?om_sem_cid=hho_sem_nam_us Google_SMB_Store_Home&inid=hho_sem_s y:us.ggl,en:e%7Ckw0000006084%7CSMB
Training and Exercises

- Free training materials, security configuration guides from Internet Security Alliance: http://www.isalliance.org/
- Free DOD user training: http://iase.disa.mil/eta/Pages/online-catalog.aspx

Government Resources

- Federal Trade Commission’s Interactive Tutorial: www.ftc.gov/infosecurity
- National Institute of Standards and Technology (NIST)’s Computer Security Resource Center: www.csrc.nist.gov
Government Resources (cont’d)

- NIST Guide to Selecting Information Technology Security Products:  

- NIST’s Risk Management Guide for Information Technology Systems:  

- NIST Small Business Corner - A link to the NIST-SBA-FBI Small Business Information Security outreach pages:  

- NIST Small Business Information Security:  

- SBA, NIST and FBI partnership on Cybersecurity for small businesses:  
  [http://csrc.nist.gov/groups/SMA/sbc/overview.html](http://csrc.nist.gov/groups/SMA/sbc/overview.html)

- United States Computer Emergency Readiness Team (US-CERT):  
  [www.us-cert.gov](http://www.us-cert.gov)

- U.S. Department of Homeland Security Cyber Security Resources:  
  [http://www.dhs.gov/cyber](http://www.dhs.gov/cyber)

Publications

- Cloud Security Alliance  
  [https://cloudsecurityalliance.org/csaguide.pdf](https://cloudsecurityalliance.org/csaguide.pdf)

- Computer Security Resource Center, National Institute of Standards and Technology:  

- Microsoft Small Business Guide:  

- Protecting Your Small Business, Entrepreneur Magazine:  

- Small business Information Security: The Fundamentals, National Institute of Standards and Technology:  