2021

THE GOOD COUNCILLOR'S GUIDE TO CYBER SECURITY

This guide aims to help local (parish and town) councils and their councillors better understand the importance of cyber security and provide practical advice on minimising risks to the council. The publication features information on understanding the most common risks and how some simple steps can help protect the council's information and equipment.

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WELCOME

David Astwood
Technical director at
Microshade VSM

As our use and dependency on computers, computerised systems and the Internet grows, so the threat of unauthorised access or malicious damage to, or theft of data from, computer systems is growing at an exponential rate. At the same time there is increased pressure and responsibilities placed on Data Controllers to safeguard personal and sensitive data.

The aim of this guide is to give a high level overview of the types and impact of some of the more common cyber threats that face users of Information and Communications Technology (ICT) today, along with technologies and good practices that can be adopted to protect users and organisations against these threats.

Microshade VSM specialise in the provision of secure ICT systems, specifically designed for the town and parish council market, a market in which it has been active since 1996. Microshade VSM cater for councils of all sizes in this market.

Microshade VSM Local Council Community Cloud provides a secure and ecological managed ICT service hosted from our secure UK data centre. For customers who prefer to keep their ICT local, Microshade VSM provide a suite of appropriate security services to help keep you safe. We have provided informative presentations about cyber security to local associations around the UK, on which this toolkit document is based.

Cllr Sue Baxter
Chairman of the National Association of Local Councils

On behalf of the National Association of Local Councils (NALC), it gives me great pleasure to introduce The Good Councillor's guide to cyber security produced in partnership with Microshade.

I am sure that when most of us decided to become councillors, IT and data security were not at the top of our list of priorities. I suspect that many of us would confess to avoiding such technical matters to focus our time in our communities and on the council's work. This guide aims to show that with just a small investment of time and resource, we can protect our councils from the sorts of risks that could put our work at risk.

I am particularly keen for smaller councils to take cyber security seriously. With many councils having one computer or laptop, the council could suddenly lose years of information and hard work that may never be replaced if that device is lost or compromised. I hope this guide will show how just a few simple steps could help remove this risk and ensure local councils can continue doing good work in their communities without disruption.

During the COVID-19 pandemic, we have seen the vast majority of local councils swiftly move to remote working, with staff working from home and council meetings taking place online. There have been incredible benefits to those changes. Not just keeping everyone safe from the virus but also introducing more flexible working arrangements, making meetings more accessible to the public, and bringing in other innovations to many councils' workings. However, with the increased risks associated with this way of working, we all need to make sure that we are doing what we can to understand and reduce those risks.

Now more than ever, please take the time to consider how your council protects itself from cyber-attacks and other cyber risks. This small investment will pay huge rewards over time as your hard work in your communities is protected for now and the future.

INTRODUCTION

WHY SHOULD I BE INTERESTED IN CYBER SECURITY?

Cyber security is the protection of computer systems from unauthorised access, theft, damage or being made inaccessible. With the growth in popularity of computers, smart devices, the Internet and media sites, there has been a continuous exponential increase in attacks against computer systems with an impact on affected organisations and their reputations.

Information and Communications Technology (ICT) has many benefits, for example enabling organisations to quickly and efficiently publish and widely distribute documentation and other information, advertise events and services, store vast amounts of historical information or correspondence, and communicate with suppliers, the public, and other agencies.

GDPR and the Data Protection Act 2018 require organisations to implement appropriate measures to protect the information they hold, or risk significant fines.

Threats come in many forms and the council must mitigate against a wide range of risks. Disasters can come about from simply dropping a laptop or leaving it or a USB stick on a train, knocking over a cup of tea onto the computer, theft, fire, or sudden loss of a key member of staff who holds the passwords vital to access council information systems.

The council as a whole has a collective responsibility to see that suitable cyber security measures are implemented and supported, and all members of the council must follow good practices to keep their own systems safe.

IT SERVICES PROVIDED BY A PRINCIPLE AUTHORITY

Many local councils have systems (email/website) provided by a principle council, however it remains the local council's responsibility to ensure that their information is managed and secured appropriately. You can make sure the principal council has independent accreditation that shows good security practice such as Cyber Essentials Plus or ISO 27001, or by asking about their cyber security practices using the 10 steps to cyber security guidance.

SMALLER COUNCILS, BIGGER RISKS?

The majority of local councils in the UK fall into this category, with fewer resources and less collective experience available to undertake the necessary steps to implement good safety measures, particularly those employing a lone clerk who works from home, possibly part-time, on a computer that may not be owned by the council.

Some of the problems the smaller council may face include:

- Difficulty in keeping back-up media away from the place of work, which means that the backups could be lost in the same incident that affects the computers (fire, theft, etc).

- The clerk may not have the experience or time to keep on top of cyber security.

- Personal computers could be used for non-council business thus exposing them to unknown cyber risks.

- Business continuity could be compromised if something happens to the clerk's equipment or premises, it may not be possible to access the council's information.

- Succession planning may not be straightforward. If something happens to the Clerk, will the council be able to access the equipment or find the required passwords?

This may all sound scary and overwhelming, but with a small amount of time and effort invested regularly it is possible for councils to manage cyber security risks. This guide provides information on some of the common threats faced by users of ICT and protective measures that can be taken, along with some practical information in the appendix to support you.

YOUR RESPONSIBILITIES FOR DATA SECURITY

Local councils are responsible for the information they hold, whether in electronic form, on paper, or in any other format. Stored information must be protected from unauthorised access, accidental deletion, and malicious hacking attempts.

GENERAL GUIDELINES FOR INFORMATION STORED ELECTRONICALLY

- It should be protected by strong passwords that are never shared.
- If stored on removable media these should be locked away when not in use.
- It should only be uploaded to trusted cloud solutions.
- Servers should be sited in a secure location, away from the general office.
- Data must be backed up regularly, and backups tested.
- Also consider how you protect information on hard disks when equipment leaves the office or is retired.

Many councils find that a small disaster turns into a tragedy when they lose data, then find that their backups have not been reliable.

Tip: regularly test backups by attempting to restore data from them. Backups are the last resort when other attempts to restore a system have failed, and this is not a good time to find out that they have not been working.

GENERAL GUIDELINES FOR INFORMATION STORED ON PAPER

- When not required, papers should be kept in a locked drawer or filing cabinet.
- Do not leave papers where unauthorised people can see them, for example unattended on a printer.
- Data printouts should be shredded and disposed of securely when no longer required.

GENERAL DATA PROTECTION REGULATION (GDPR)

GDPR requires you to put in place appropriate technical and organisational measures to implement the data protection principles and safeguard individual rights. These principles must be “baked in” to your processes at every stage.

The data controller must implement appropriate technical and organisational measures to ensure, and to be able to demonstrate, that the processing of personal data complies with GDPR, and that these measures are regularly reviewed and updated where necessary.

THE CYBER THREAT LANDSCAPE

HM Government National Cyber Strategy 2016-2021: https://www.gov.uk/government/publications/national-cyber-security-strategy-2016-to-2021

This document talks in plain English (no technical jargon) about the Governments view on Cyber threats and their strategy to counter these.

CYBER THREATS

Cyber Criminals

Increasingly criminals use Information and Communications Technology (ICT) devices to either target other computer systems, or to conduct traditional crimes with increased scale or reach (fraud, bullying, data theft).

State Sponsored Attacks

Most small councils would not expect to be the target of a state sponsored attack, although Government offices are often targeted. However, commonly used ICT and Multi-Media systems which the organisation use may be targeted, for example popular systems like Microsoft Windows or Facebook can be targeted, and councils using these systems could be infected or hacked, unless appropriate protective measures haves been put in place, as described later in this document.

Example: In May 2019 a vulnerability in WhatsApp that enabled hackers to install surveillance programs onto smart phones, was traced back to the NSO Group – an Israeli “cyber arms dealer”.

Hacktivists

Issue-oriented individuals or organisations who have an axe to grind or wish to make a statement. For example, perhaps an individual in a community may disagree with a planning decision, and target the council website or computer systems to draw attention to their objection.

Insiders

Threats from insiders can come in various guises. There could be malicious action taken by a disgruntled member of staff, accidental deletion of key information, or even the risk of a key person leaving unexpectedly without passing on critical information.

VULNERABILITIES – WHY ARE THESE THREATS A RISK?

An expanding range of Internet connected “smart” devices

So many devices now have a computing element and are connected to the Internet (Computers, smart phones and tablets, cars, fridges, home management systems, etc), that it gives attackers a wide range of targets.

Hackers may even utilise some of these devices to launch co-ordinated attacks on other computer systems.

Poor cyber hygiene and compliance

There is a lack of skill and training in how to implement and maintain safe systems and good working practices

Legacy and unpatched systems

Many organisations in the UK will continue to use vulnerable legacy systems until their next IT upgrade

Availability of hacking resources

Readily available hacking information and user-friendly hacking tools are available on the Internet and enable those who want to develop a hacking capability to do so.

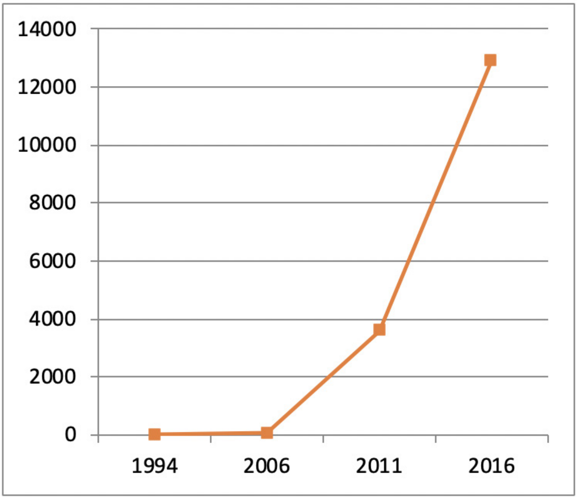
The Growing Threat of Malware

Malware (malicious software), is software that is specifically designed to disrupt, damage, or gain unauthorized access to a computer system. A list of types of cyber-attack and malware is given in Appendix A.

The amount of malware has grown exponentially since personal computers first came into use.

See for Yourself

This shows the staggering number of malware and cyber-attacks detected by Kaspersky Labs, in real time — https://cybermap.kaspersky.com/stats/



In 2019, the AV-TEST Institute registers over 350,000 new malicious programs (malware) and potentially unwanted applications every day, and had registered 928.6 million for the year to August.

HOW IS MALWARE DELIVERED?

What Systems Are Targeted?

Writers of Malware want to make as big an impact as they can, normally in terms of publicity, financial gain, disruption, identity theft, or blackmail. To this end, they target systems or organisations which, if successfully compromised, will give them the biggest returns. They often target:

- Common computing devices or popular apps and games. For example, the WannaCry virus targets Windows 7 computers. In May 2017 an estimated 300, 000 devices were infected worldwide.
- Banks and financial institutions. For example, in Sept 2017 Equifax, a US Credit Agency, was hacked. 143 million accounts were stolen including customer social security numbers and driver's license numbers.
- Social media sites with many user accounts. For example, the WhatsApp vulnerability of May 2019 was estimated to impact a potential 1.5billion users.

Malware Delivery

The most common ways of delivering Malware are:

- Emails. By far and wide the most common delivery mechanism is emails containing links to malicious website programs, or attachments containing malware.

- Popular Websites and Multimedia Sites. If a hacker can put malicious code on a popular multimedia or web site, for example Facebook or the BBC Good Food Recipe site, it could still be run by thousands of visitors in just a few minutes.

- USB Drives. USB drives are a very effective way to deliver malware directly to the computer, by-passing firewalls and spam filters, and are a cyber-security problem in many ways.

Apple Macs and Linux Systems Are at Risk Too

Malware and cyber-threats are not limited to Windows systems. As Apple Macs and Linux systems gain popularity, they too are being targeted (Kaspersky Labs identified over 6 million attacks against Apple Macs in 2015).

These systems can be vulnerable to direct attacks, or used as hosts on which Windows viruses can reside and be distributed to Windows computers.

COMPUTER DEVICE AND NETWORK PROTECTION

ANALYSIS OF AN ENCRYPTION VIRUS DISASTER - WANNACRY VIRUS AT THE NHS

In May 2017, the WannaCry virus infected many computers across the NHS (and other organisations), which encrypted any and all files accessible from the infected computer account. Patient records, operating theatre timetables, and other records were made unavailable so that many NHS services ground to a halt. The Daily Telegraph reported that 19,000 appointments had to be cancelled costing the NHS £20m, and the clean-up operation cost a further £72m.

By looking at what we know about the WannaCry virus, and reports from the time, we can build a picture of what vulnerabilities were exploited, and learn to prevent this sort of thing happening at our local councils.

Further reading: National Audit Office report: WannaCry cyber attack and the NHS — https://www.nao.org.uk/report/investigation-wannacry-cyber-attack-and-the-nhs/

ENDPOINT SECURITY

Endpoint Security is a suite of technologies that are designed to protect your computing device from a variety of cyber threats, for example malware, software vulnerabilities, malicious websites, unauthorised access or

1

The WannaCry virus was delivered as an attachment or link, in an email, to recipients at the NHS.

A good spam filter would be expected to filter out malware before it is delivered to a recipient's Inbox. However, be warned that spam filters are never 100% effective.

2

Recipients opened an attachment from an email received from unknown senders. The malware is activated.

It is risky to open attachments or click links in emails unless you check with the sender first – even if the email appears to come from a known sender. Computer users need training to spot dangers online. Good training develops safe working practices.

3

Anti-malware did not stop the application from encrypting files and folders, or from spreading.

A good anti-malware program should know that applications are not expected to encrypt files and folders, and should have put a stop to this. There is further advice on how to choose a good solution later in this guide.

4

A vulnerability in the Operating System allowed the malware to run with system permissions.

Microsoft had released updates which closed the vulnerability 2 months before the NHS were infected, and published details in computer press 1 month before the incident. Always update your computer and software as soon as possible as they are released.

5

Press reports at the time indicated that some records could not be recovered.

Test your backup systems regularly (every month or quarter), to confirm they are working correctly and that you can restore the information you need to protect.

program execution, and more.

Choosing good endpoint security

There are many competing Endpoint Security products on the market, offering a variety of protection technologies, and you must choose the right one according to your needs and budget. Examples of the choices you can make may be:

- Data Encryption: you may need this if you have a portable device, such as a laptop or smartphone, if your Operating system does not already provide this function.

- Backup: some Endpoint Security offer file backups as part of the package, if you don't have another solution in place.

Tip: Look for "Real-Time Protection" or equivalent technology. This technology recognises the normal behaviour of common applications, and if it detects the application doing something unusual it will put a stop to it. This should protect against encryption attacks and many newly emerging threats.

Independent Endpoint Security testers

Free and independent Endpoint Security testers' websites show results from regularly testing of the security products on the market against emerging cyber threats. Visitors can use this information to see what products are performing well, and have been performing well over a period of time, to help select a product with a reliable history of good performance.

Tips:

1. New computers often come with trial protection software pre-installed. This does not mean that the protection software is good, so much as that the software manufacturer has a distribution deal with the computer manufacturer. Check the reputation of pre-installed protection software with an independent test site before committing to it.

2. Look for “Real-Time Protection” or equivalent technology. This technology recognises the normal behaviour of common applications, and if it detects the application doing something unusual it will put a stop to it. This should protect against encryption attacks and many newly emerging threats.

3. Look for “behavioural analysis”. This technology recognises anti-malware by the way things it does, for example, an encryption virus will first load a list of all files it can find into memory, ready to attack them. This is another technology that can protect against newly emerging threats.

Configure your Endpoint

Check that you have installed a license. Check that the solution will do a full system scan at least once a week. Plan to check back regularly to see that your solution is still working correctly.

Test your Endpoint Security

Use a reputable website to download benign files that contain virus signatures designed to trigger your anti-malware without causing damage. This not only demonstrates whether your systems are protected, but provides an opportunity to see and perhaps plan for what will happen, in the event of a real incident.

SYSTEM UPDATES

Hackers look for bugs or vulnerabilities in the Operating System which allow them to e.g. learn your user names and passwords, and send these back to the hacker. Operating System updates are written by the manufacturer (Microsoft, Apple etc.) to close these vulnerabilities or mitigate the risks, and must be applied regularly and as soon as they become available.

Check System Update Status

Plan to check periodically that updates have been running regularly and successfully:

- Windows 8-10: open the Settings App (from the start menu), and select "Updates and Security".

- Apple Mac: Open "System Properties" from the "Apple" icon

- Linux: check the recommended procedure for your Linux variant. A regular update task can be configured as a scheduled (cron) job.

APPLICATION UPDATES

Applications are the programs on computers that are used by the computer user, such as word processors, spreadsheets, web browsers, etc. Vulnerabilities in the applications are equally useful to hackers, and the writers of the applications publish updates to address these risks.

Periodically review the software programs installed, making sure they are up to date. Software programs which are no longer used or supported should be removed.

There are software tools on the market (often part of your Endpoint Security) which will audit your computer periodically and notify you of any software updates that are required, and manage the update for you. Be sure to choose a reputable provider.

THE RISK OF UNSUPPORTED SYSTEMS AND SOFTWARE

If you are using unsupported operating systems or programs, security updates for these products are no longer provided and users are at an increased risk of cyber-attack. Plan to upgrade your systems.

These products are unsupported or near end of support: Windows XP, Vista and Microsoft Office 2007, Server 2003, or earlier are unsupported. Windows 7, Microsoft Office 2010, Server 2008, Server 2008 R2 are unsupported from January 2020.

USER ACCESS CONTROL

User Account Control (UAC) is a security feature of Windows which helps prevent unauthorized changes to the operating system.

Check that UAC is not disabled, and pay attention to any un-expected prompts from UAC that may indicate malicious activity by a software program.

WI-FI AND SMARTPHONE TETHERING

Wi-Fi uses radio signals to connect your devices to the Internet, via an internet router which supports Wi-Fi. Smartphone users have a similar option which enables the computer to connect to the Internet via the Smart Phone's telephone service, again via using radio signals.

Anybody in range could potentially intercept those radio signals and see everything you are doing on the

Internet, staling your passwords or sending you malicious information in place of the legitimate web service.

This is particularly true of operators of Public Wi-Fi as all your Internet traffic passes across their routers and could be re-directed to malicious sites of the operators choosing.

VPN – VIRTUAL PRIVATE NETWORK

A Virtual Private Network ensures that your communications are encrypted between your device and your service provider:

- Your communications are not readable
- Your location is not traceable
- Your ISP cannot track your Internet history

VPN services can be purchased and downloaded on-line for computers and smart devices, and some Internet routers support a VPN service which would protect all devices that are connected to the router.

FIREWALLS

A firewall is usually part of your Internet router and/or may be installed on your computer. The firewall prevents unauthorised access into your organisation’s network from the Internet (while allowing your authorised users to access the Internet). Some firewalls also have very sophisticated tools built in that can block spam or malware (inbound or outbound), restrict what websites users can access, and many other things.

Firewall Checks

Common problems with basic firewalls are:

- The administrative password has not been changed from the default password that was shipped with the device, enabling hackers to take control of the firewall and access any devices protected by it.
- The firewall is out of date or no longer supported. Check your firewall firmware or operating system and update it when a new version is available. Replace unsupported devices.
- Ports have been opened enabling access from the outside (see below). Hackers will quickly find these ports and start to probe to find what they can access.

Firewall ports

- Firewall ports enable network administrators to control which services on the local network can be accessed from the Internet. Each port has a number according to the sort of service that is usually available on that port. Common port numbers are 21 (file transfer), 25 (email delivery) and 80 (web server)

- If you have an email server on your network, for example, you would open port 25. Unused ports should be closed.

Check What Ports Are Open in your Firewall

Open your Internet browser and search for "What's My IP", and open a site which will report your IP address, for example https://www.whatismyip.com/

Example: The website will return an IP address number like 76.145.213.195

Use the above number on a port scanning site, for example https://hackertarget.com/nmap-online-port-scanner/ to see what ports are open.

Review any open ports and close any that are not needed. Your router administration guide or internet service provider (ISP) should show you how. Router administration guides are often available online.

SMART PHONES AND TABLETS

Smart phones and tablets are increasingly used in all areas of business. They can learn and hold large volumes of sensitive information about the owner and their contacts, access work data and services, connect to unsafe networks, and are inherently losable, attractive to thieves, and vulnerable to hackers and malware. Protect these devices like any other computer:

- Use a strong password or PIN
- Think before installing Applications, and be suspicious when applications want to access data for example contacts
- Use security / anti-malware software
- Keep the Operating System and Apps up to date
- Set up device tracking and remote wipe
- Enable device encryption
- Make sure you are running backups
  - Be wary of public Wi-Fi

BACKUPS

Disaster can strike causing loss of data despite anyone's best efforts to protect the computer systems, leaving computer users only one course of action – to restore from backup.

Be Prepared to Restore Your Data

- Periodically review and double check the data you need to include in your backups
- Think about backup retention – how long the backup is kept before it is overwritten
- Take regular backups – any work done since the last backup will need to be re-done.
- Monitor backup reports and address problems
- Store backup media safely at a location remote from the systems, to avoid the systems and the backups being lost together in a fire or burglary.
- Periodically check that you can restore files from your backups.

It can be difficult for small councils to store backup media away from the place of work. For computers located in the office, the clerk may be able to take backup disks or tapes home when not in use. If the main place if work is the clerk’s home, then nominate a councillor to hold the backup media.

Backup Retention

Backup retention means how long is a backup kept, before it is overwritten. Ask yourself “If a file or folder is accidentally deleted, corrupted or overwritten today, how long do you want to allow for someone to notice there is a problem and still be able restore it from a backup”. You will want enough backup disks or tapes stored to allow you to go back your preferred period in time.

An example backup retention policy is given in the Appendices of this guide.

CYBER LIABILITY INSURANCE

You may need cyber and data risks insurance if you:

- hold sensitive personal data, such as names, addresses or banking information
- are reliant on computer systems to conduct your business
- have a website
- are subject to a payment card industry (PCI)

merchant services agreement

There are several insurers that specialise in the town and parish council market. In addition to a financial re-imbursement, some offer additional professional services which might be essential in the event of an incident, for example advice on finding ICT professional help to recover data, communications assistance to deal with affected contacts and the press, and so on.

PORTABLE DEVICES, USB DRIVES AND ENCRYPTION

USB drives or memory sticks pose serious security risks in terms of malware delivery, and along with any portable drive or device are a risk of data loss or data breach.

Malware Delivery with a USB Drive

Malware delivered on a USB drive by-passes the usual first lines of defence (firewalls and spam filters).

When someone plugs a USB drive into a computer, the computer looks for program information on the drive. If a hacker puts their malicious code onto a USB stick, it would be executed automatically when the USB drive is plugged into a computer.

Researchers have shown that on finding a USB drive, many people will instinctively plug it into their nearest computer to see what is on it, not realising that this will automatically run any malicious code that might be on there.

Data Breach with a USB Drive or Portable Device

USB drives and other portable devices are easily mislaid, stolen or broken, and should be encrypted to protect against accidental loss and data breach.

Sensitive information (for example personal data, such as names, addresses or banking information) should:

- Never leave the organisation's secure computer system.
- Not be put onto USB drives or portable devices, which are easily mislaid.
- Be protected by encryption, if on portable drives or devices.

Example: Serious data breach from USB disk: https://www.bbc.co.uk/news/business-45785227

Encryption to Protect Your Data

Encrypted files are encoded rendering them unreadable to anyone who does not have the pass code or key.

Any portable media or laptops leaving the organisation premises should be encrypted to protect sensitive data on them. Disk Level Encryption ensures that the Operating System is all encrypted and cannot be booted without the key. This protects your device from hackers who can crack your Windows password (which is often quite straight forward!).

Windows Pro editions come with encryption software called BitLocker built in, or 3rd party encryption software is available.

EMAIL SECURITY

COUNCILS CAN BE EASY TARGETS

It is very easy for cyber criminals to send an email and make it look like it comes from someone you know and trust. Councils are easy targets because:

- They publish information about their activities, employees and councillors online, helping spammers to target or impersonate individuals in the organisation, and using insider information to make fraudulent emails sound plausible.

- Recipients of council emails (residents, councillors etc) often use free email accounts from popular providers (which are targeted by hackers), and easily cracked passwords or poor security practices.

SPAM

Spam is electronic junk mail or newsgroup postings, usually unsolicited. Approximately 50% of all emails sent are spam. Spam can be just annoying, but often contains malware, links to malicious websites and phishing links, or attempts to impersonate known contacts in order to defraud the recipient.

What are Spam Filters?

Spam filters are designed to prevent spam from being delivered. Spam filters can operate in several places, for example:

- Your email client (for example, Microsoft Outlook) may put spam in the Junk folder. The problem is that the spam is now on your computer and could accidentally be opened.

- Your mail server (the server where your emails arrive, which may belong to the council or to your email service provider) or firewall may intercept the spam before it is delivered to your mail client. This is better but still the malicious email is on your network.

- A cloud based spam filter can filter spam before it ever reaches your network.

Spam Filters - Necessary but Fallible!

Spam filters can remove a lot of unwanted or malicious spam, but they are just computer programs that aim to identify spam according to the content of the email – where the email came from, the words used, whether there are attachments or links inside, and so on.

Cyber criminals spend their time designing malicious emails that will get past any spam filter. For example, a recent trend is to send an email containing a link to a clean webpage (which they own), which will get though most spam filters. Once the email has been delivered, they change the webpage content to something malicious, to infect the computer of anyone who clicks on the link.

Choosing a Good Spam Filter

As with all things, there are many spam filters available with various protection technologies and other features. Make a decision based upon whether you want the spam filter in the cloud, or on your local system, budget, and protection offered. Look for some of these features:

- High rate of detection.
- Low rate of false positive detection (legitimate emails blocked as spam).
- Malware filtering.
- Anti-phishing link protection (both pre- and post-delivery).
- Protection for outbound messages (prevents your mailbox being used by spammers, if compromised.

Guard Your Users Against Spam

Inevitably, some spam will get through any spam filter. Be suspicious of emails which:

- Contain links or attachments, whoever it is from (it is easy for a hacker to send an email that looks like it comes from a trusted contact)
- Come from someone you don't know
- Comes from a known contact but
  - Is asking for money or personal information
  - Does not use the sort of phrases that person normally uses
- Contains spelling or grammatical errors (the sender's first language is often not English)
- When you open an attachment, if it prompts you to "enable Macros", it is trying to run another program in the background. This is probably malicious

Tips:

1. **Hover over the sender's address to see who really sent the email.**
2. **If there is a link in the email, hover over the link to see the website it really points to.**

PROTECTING THE COUNCIL'S EMAIL REPUTATION

Email reputation is important. Reputation is based upon whether your email server or email addresses have been reported as sending a lot of spam. Senders with bad reputations will find that the emails they send are more likely to be treated as spam, ending up in people's junk folders. Sender's with especially bad reputations will be blacklisted, which means that recipient email systems will refuse to deliver your emails at all.

Bulk Emails

It can be embarrassing and difficult to resolve if a council's email domain is blacklisted. However this can happen even if staff or officers have been sending what they believe to be legitimate emails, but which automated spam filters detect as spam. Common habits employed by councils which trigger spam filters include:

- Sending bulk emails (sending an email to dozens or hundreds of email recipients).
- Sending emails which contain links or pictures which contain links, and especially if these links go to pay sites.

An example might be the case of a council which wants to advertise an upcoming event, and so includes an email footer on all outgoing emails with a picture advertising the event, which contains a link to a site where tickets can be purchased. These can soon trigger spam filters, especially when emails are sent in bulk.

To avoid getting blacklisted, it is a good practice to use an online bulk email service, to send emails to multiple recipients or for advertising, or the Gov.UK Notify service.

Gov.UK Notify service — Councils with a .gov.uk email address can send an unlimited number of emails for free with the GOV.UK Notify service : https://www.notifications.service.gov.uk/

Securing government email

This guidance applies to all email domains that public sector organisations run on the internet.

Central government require all government organisations to secure their emails following guidance on their “Securing government email” web page. You must:

- Encrypt and authenticate email in transit (see below)
- Use extra encryption if your data needs more protection – for example if the content contains sensitive or personal information that should only

be read by trusted recipients.

- Make sure the recipient protects the data you send to them by complying with standards such as Cyber Security Essentials (explained later in this guide) and GDPR.

- Make email security invisible to end users as far as practically possible – in other words the email system really should make emails secure without the user needing to take extra steps

Encrypt and authenticate email in transit

As this is quite technical, councils may need to involve their email mailbox provider to configure their email systems appropriately, although there are guidelines accessible from the Securing government emails website

1. TLS (Transport Layer Security): Your email system must use TLS version 1.2 or later for sending and receiving email securely. This encrypts your emails so they cannot be read in transit. This is a function of the email server that you use to send the email.

2. DKIM (DomainKeys Identified Mail): adds a unique encrypted signature to your outgoing email. The receiving system can check the signature against the received message contents to ensure that the email

has not been tampered with in transit.

3. SPF (Sender Policy Framework) records must be published on your domain which inform receiving mail systems which mail servers are authorised to send emails from your domain. Emails from your domain that are received from other servers are treated as spam.

4. DMARC (Domain-based Message Authentication, Reporting and Conformance) records must be published on your domain, advising receiving systems how to validate emails from your domain, and what to do or who to inform, if non-compliant emails are received.

POLICIES, STANDARDS AND TRAINING

VULNERABILITIES INTRODUCED BY COMPUTER USERS

“There is no conceivable information security system that can stop one person out of a hundred opening a phishing email, and that can be all it takes.” — Ciaran Martin, Director General for Cyber Security, GCHQ – June 2015 (source: HM Govt National Cyber Strategy 2016-2021)

No matter how much technology is in place to protect our computer systems, the weakest point in an organisation's security is often the person using the computer, who can be persuaded to undermine their security systems for many reasons.

Examples of how human vulnerabilities are exploited include:

Desire to be rich / to get something for free

- You've won! Click here to claim ...
- You've paid too much tax ...

Paranoia or Gullibility

- This is Microsoft – I need to help you fix a problem on your computer

- Your mailbox is full and cannot send more emails. Click here and enter your mailbox password to clear it

Need for Sociability

- Can I be your online friend?

Careless typing

- Many variant spellings of google.co.uk that land on malicious websites!

Inquisitiveness

- We failed to deliver your parcel – please click here …
- Shocking celebrity pictures … click here

TRAINING AND OTHER USEFUL SOURCES OF INFORMATION

There are numerous training resources available to computer users and which could become part of a personal development plan. Sources include:

Kaspersky Automated Security Awareness Training10 is an online training and certification programme, requiring about 15 minutes per week, which builds safe practices as habits.

The International Computer Driving License is an organisation which offers a range of ICT and cyber security modules and programmes covering from the basics to more advanced subjects.

Kaspersky Labs' Advanced Security Awareness Training is an on-going online training curriculum teaching good behaviour through simulation and repetition. It adapts to a user's role and experience, provides management reporting and can be useful to demonstrate an organisation's commitment to cyber security, which is useful in the event of an incident which the Data Commission may need to investigate. Available through Microshade VSM.

CYBER SECURITY ESSENTIALS

National Cyber Security Centre "Cyber Essentials" website provides up to date guidance on how to keep safe as well as the Cyber Security Essentials programme, which is a certification programme which enables holders to demonstrate that they are working to secure their ICT systems against cyber-attack.

CYBER SECURITY SELF-ASSESSMENT

The LGA recently launched their cyber security self-assessment tool which will halp you assess your security readiness.

ICT POLICIES AND PROCEDURES

Councils should implement, enforce and maintain good policies and procedures to govern and guide users of their ICT resources and data. Example policy templates can be obtained online, or from HR and other business management consultancies.

ICT Usage Policy

This policy should advise staff, officers, and councillors on appropriate use of council equipment and information for, as well as what is inappropriate and should answer questions like:

- Who retains ownership of information created by staff or officers which they have stored on council equipment, and which may be personal in nature

- Is it appropriate for users to use their own devices, and in this case how is information stored on these devices, and what happens when the owner is no longer associated with the council?

- If equipment or mailboxes are provided to councillors in order that the can perform their duties while in office, who retains ownership of these things, and what happens to any information held in mailboxes or on hard disks?

- What level of cyber security training should be reached for users with access to council emails or computer systems (staff, officers and councillors)

Password Policy

The National Cyber Security Centre document "Password administration for system owners" contains up to date information on good practices for your passwords. Where passwords are employed, the advice is to use a stronger password, but change it less regularly.

A password policy needs to address, among other things:

- How complex must passwords be, and how often must they be changed?

- Is an account locked after a number of bad password attempts, and how is it then unlocked?

- What is the procedure when a staff member leaves, to remove their system access?

- Ensure that users have no more system access than necessary.

Tips:

1. Avoid using the same password on multiple systems, especially online – if a hacker cracks your password on one system, they will try the same password on other common services.

2. Search the Internet for commonly hacked passwords, and avoid these.

Incident Response Procedures

Who takes what steps in the event of an incident? For example, if a computer is infected with a virus, the user should probably remove it from the network immediately before the virus spreads further.

Equipment Maintenance and Safe Disposal Procedures

How to keep ICT equipment running safely and securely, and how to dispose of it securely when it is no longer used.

APPENDICES

SECURITY SERVICES FROM MICROSHADE VSM

For more information please see our website: www.microshadevsm.co.uk

Local Council Community Cloud

Microshade VSM's flagship service is the "Local Council Community Cloud" with significant benefits for councils over Office 365. Our suite of managed services is developed specifically for the local council market, delivered from servers located in the UK, and accessible securely over the Internet.

The Local Council Community Cloud removes both applications and data from your vulnerable local computers, and addresses numerous issues commonly faced by councils, including:

- Business Continuity and Succession Planning
- Protection from malicious actions
- Cyber Security issues under Data Protection Regulations
- Data back-up compliance
- Flexible and secure working, from any location

(remote sites linked as standard)

- Data and applications located in a secure environment situated in a UK Data Centre
- Simplifies compliance with Data Transparency Code requirements
- Ecological and cost saving, reducing the need for continuous re-investment in equipment
- Fully supported
- A full suite of appropriate applications for all a council's needs
- Suitable for smaller councils as well as larger councils

Electronic Document Management

Quickly scan paper documents and incoming post into our secure, online filing system. Configure the system to automatically file documents according to their type (bills and invoices, meeting minutes, etc). Advanced document retrieval tools enable instant document retrieval.

Managed Desktop Security

Managed Desktop Installation Server – upgrade all computers to a clean Windows 10 in minutes, with managed Endpoint Security pre-installed. Managed operating system and application updates, application whitelisting option, drive encryption option, and wipe hard disk before disposal.

Managed Endpoint Security - installation of a leading Endpoint Security product, centrally managed and monitored by our technical support team.

Managed Android Endpoint Security - installation of a leading Endpoint Security product, centrally managed and monitored by our technical support team, including track, lock, or wipe of lost devices.

ICT security audit - inexpensive security MOT for your computers.

Other Products and Services

Kaspersky Advanced Security Awareness Training

Email Spam and Virus filter – filter spam and viruses in the cloud, before they are delivered to your mail server or Inbox. Includes Impostor protection and Anti-Phishing pre- and post-delivery.

Mailboxes – full Microsoft Exchange email mailboxes (compliant with government requirements).

GDPR pack – GDPR templates and procedures, consultancy, outsourced DPO.

SUGGESTED SECURITY SCHEDULE IN THE OFFICE CALENDAR

Annually

Endpoint Security license renewal

Review Policies and Procedures

Review staff cyber security training

Monthly or Quarterly

Endpoint Security checks:

- Endpoint Security product is still supported
- Update Endpoint Security version to the latest version
- Endpoint Security on all systems reports that it is

operating correctly

- Benign virus tests (eicar.com or wicar.org)
- Definitions are up to date
- Full system scan scheduled weekly
- Review logs

System Updates checks:

- Check all equipment including computers and servers, Internet routers, firewall routers etc
- Operating system is still in support? What is the End of Support date? Retire and replace systems which are out of support
- Check automated system updates are up to date
- System updates are scheduled to run regularly (at least weekly)
- Review logs

Application Updates checks:

- Application is still in use? Uninstall unused applications

- Applications still in support? What is the End of Support date? Uninstall unsupported applications

- Applications updates are up to date? Update out of date versions

Backup review

- Test that you can restore data from your backups

- Check that you are backing up everything you should be

RETENTION POLICY EXAMPLE

This example is based on the "Grandparent-Parent-Child model", which allows the following:

- Recently corrupted or lost files can be restored to the state they were in from any day over the last week.

- Files that were corrupted or lost a longer time ago can be restored from the state they were at the end of any week over the last month, or from the beginning of any month for the last quarter.

You will need the following backup media (tapes or disks according to your system):

- 2 sets of media labelled “Daily Set 1” and “Daily Set 2”.
- 4 sets of media labelled “Week 2”, “Week 3”, “Week 4” and “Week 5”.
- 3 sets media labelled “Month 1”, “Month 2”, “Month 3”.

Carry out your backups according to the table below. At the end of each week, take that week's daily and weekly or monthly media off site until they are needed again.

Differential vs. Incremental backups

Full backups back up all your data, but this is time consuming and uses a lot of backup media.

Differential backups save on the amount of media you need. Differential backups only save any changes since the last full backup. On Monday, anything changed on Monday is backed up. On Tuesday anything changed on Monday or Tuesday is backed up, etc. To restore data from Tuesday, you need the last full backup media, plus the Tuesday media.

RETENTION POLICY EXAMPLE

Day	Media label	Backup type
1st Friday of Month	Month 1	Full backup
Tuesday-Sunday	Daily Set 1	Differential (changes since the last full backup)
2nd Friday	Week 2	Full backup
Tuesday-Sunday	Daily Set 2	Differential (changes since the last full backup)
3rd Friday	Week 3	Full backup
Tuesday-Sunday	Daily Set 1	Differential (changes since the last full backup)
4th Friday	Week 4	Full backup
Tuesday-Sunday	Daily Set 2	Differential (changes since the last full backup)
1st Friday of Month	Month 2	Full backup
Note – from this point start re-using media		
Tuesday-Sunday	Daily Set 1	Differential (changes since the last full backup)
2nd Friday	Week 2	Full backup
Tuesday-Sunday	Daily Set 2	Differential (changes since the last full backup)
Etc		

Incremental backups save even more space on your media by backing up only changes from the last full or incremental backup, whichever was most recent. On Monday, files changed on Monday are backed up. On Tuesday, files backed up on Tuesday are backed up but files changed on Monday are not. To restore data from Tuesday you need the last full backup media, plus the Monday and Tuesday media. This is time consuming and if any backup media in the sequence is lost or corrupted, you will not be able to restore from backups after that date.

TYPES OF CYBER ATTACK AND MALWARE

Types of Cyber Attack

- Backdoor – a method that allows security to be bypassed – perhaps built in by software vendor
- Denial of Service – prevents legitimate users from being able to work
- Direct access – accessing the target computer directly
- Eavesdropping – intercepting communications between one computer and another
- Spoofing – a malicious system which masquerades as

another, trusted system

- Phishing – an attempt to have the user disclose sensitive information such as passwords or credit card details, normally via email

- Clickjacking – invisibly overlaying a malicious website over a trusted website in order to intercept user input

- Social engineering – aim to fool a user by impersonating a contractor, bank representative, etc

Types of Malware

- Viruses/Worms - software which can copy itself and insert itself into other programs, usually for malicious purposes

- Trojan Horse - a program which appears innocuous, helpful or interesting in order to persuade a user to install it

- Adware – delivers annoying advertisements

- Spyware – collects data and keystrokes including passwords and sends it to a 3rd party

- Ransomware - encrypts sensitive data and demands a ransom for its release, otherwise the data is deleted

- Bots - programs designed to automatically carry out specific operations. Large numbers of infected computers can be manipulated to conduct a synchronised “Denial of Service” attack

- Rootkits - install themselves deeply into the Operating System in order to remain hidden

- Backdoors - a method that allows security to be bypassed – perhaps built in by software vendor

RESOURCES

10 steps to cyber security	https://www.ncsc.gov.uk/collection/10-steps-to-cyber-security?curPage=/collection/10-steps-to-cyber-security/introduction-to-cyber-security/executive-summary
Data Protection Act 2018	https://www.legislation.gov.uk/ukpga/2018/12
Guide to the General Data Protection Act	https://www.gov.uk/government/publications/guide-to-the-general-data-protection-regulation
AV test Institute	https://www.av-test.org/en/statistics/malware
AV Comparatives	https://www.av-comparatives.org
AV Test	https://www.av-test.org/en
Eicar	https://eicar.org
Wicar	https://wicar.org
Securing government emails	https://www.gov.uk/guidance/securing-government-email
Kaspersky Automated Security Awareness Training	https://www.microshadevsm.co.uk/cybertraining.php
International Computer Driving License	http://ecdl.org
Cyber Essentials (NCSC)	https://www.cyberessentials.ncsc.gov.uk

RESOURCES

LGA Cyber Security Self-Assessment	https://www.local.gov.uk/our-support/efficiency-and-income-generation/cyber-security/cyber-security-self-assessment-tool
Password policy: updating your approach (NCSC)	https://www.ncsc.gov.uk/collection/passwords/updating-your-approach
Password administration for system owners (NCSC)	https://www.ncsc.gov.uk/collection/passwords
Small Business Guide: Response & Recovery (NCSC)	https://www.ncsc.gov.uk/collection/small-business-guidance--response-and-recovery

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109 Great Russell Street
London
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020 7637 1865
nalc@nalc.gov.uk
www.nalc.gov.uk

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The Good Councillor's guide to neighbourhood planning

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National Association of Local Councils (NALC)
109 Great Russell Street, London WC1B 3LD
t: 0207 637 1865 e: nalc@nalc.gov.uk w: www.nalc.gov.uk