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Cyber risk management

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Cyber risk management for schools

Introduction

Schools face a myriad of challenging hazards and threats and they now have to prepare for human-caused cyber threats. These incidents can be accidental or deliberate and disrupt education and critical operations; expose sensitive personally identifiable information (PII) of students, teachers, parents and staff; and can lead to high recovery costs.

This report is not written from a technical perspective. Instead, it looks at the management steps that are required across the whole school in order to be cyber secure. It primarily focuses on the challenge of protecting against targeted, unauthorised attempts to access digital information, including research.

Cyber threats can impact either the human (students, teachers, and staff) or the physical or virtual (e.g. information technology [IT] networks and systems) elements. While there may be some overlap in addressing human versus physical/virtual threats, preparing for each type can require input from different individuals with experience or expertise on that topic and unique actions before, during, and after an incident. Schools may therefore choose to plan for these threats separately, but still under a broader umbrella of cyber threats.

The cyber threats facing schools are varied. There are a variety of general threats to the school and its infrastructure, such as through Distributed Denial of Service attacks (DDoS) that may directly or indirectly target a school's network. General criminal and fraudulent threats targeting users in order to obtain personal data for identity fraud. There are also increasingly targeted attempts to obtain potentially sensitive data from schools. This may include personal data of students, parents or staff held by the school or certain types of information, such as research, for commercial or political means.

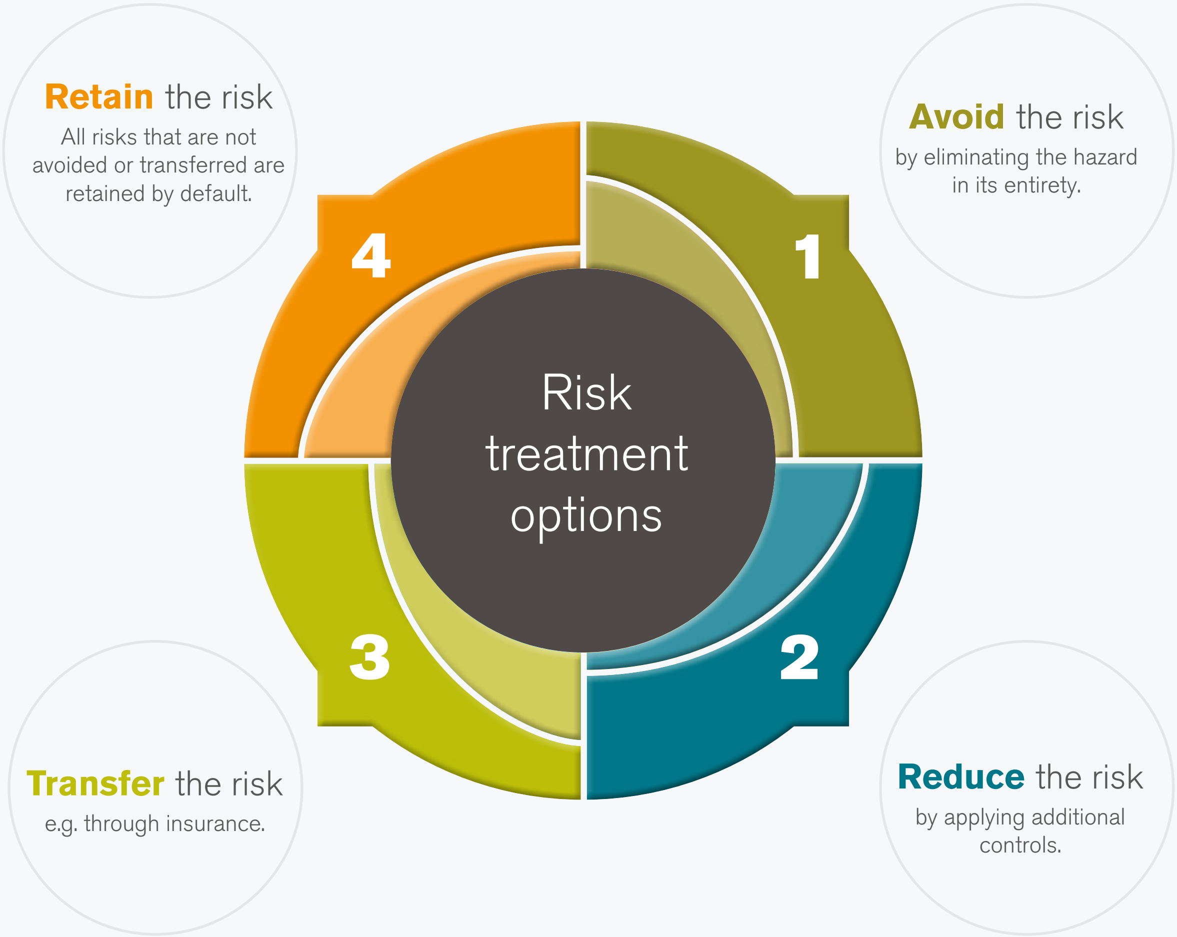
Treatment of the risk

The starting point of risk management is an acceptance that risk can't simply be abolished. Risk must be recognised and then managed in some way or other (classically to either **avoid**, **reduce**, **transfer** or **retain**). This can be easier said than done, particularly when confronted with a demand to 'abolish risk', as if that were an easy and simple option.

There are four ways you can treat a risk:

Generally, you need to do everything ‘reasonably practicable’ to protect the school from harm.

This means balancing the level of risk against the measures needed to control the real risk in terms of money, time or trouble. However, you do not need to take action if it would be grossly disproportionate to the level of risk.



Avoid the risk
by eliminating the hazard in its entirety.

Reduce the risk
by applying additional controls.

Transfer the risk
e.g. through insurance.

Retain the risk
All risks that are not avoided or transferred are retained by default.

Look at what you're already doing and the control measures you already have in place. Ask yourself if you can get rid of the hazard altogether?

If not, how can you control the risks so that damage or loss is unlikely?

1. Avoid the risk

The easiest way for a school to manage its identified risk is to avoid it altogether. In its most common form, avoidance takes place when a school ceases any activities known or perceived to carry a risk of any kind. Everything you do will involve risk. To run a busy school, trying to avoid risk in its entirety is itself a risk. By being overly cautious, you risk missing the chance to work in an efficient manner or could limit the student's opportunities for learning.

2. Reducing the risk

The following advice has been produced by the NCSC (National Cyber Security Centre, a part of GCHQ). Following this advice will significantly increase your protection from the most common types of cyber attack.

The topics covered are easy to understand and cost little to implement. This advice can't guarantee protection from all types of cyber attack, but it does show how easy it can be to protect your school's data, assets, and reputation.

Backing up your data

All schools, regardless of size, should take regular backups of their important data, and make sure that these backups are recent and can be restored. By doing this, you are ensuring your school can still function following the impact of a cyber attack or flood, fire, physical damage or theft.

Furthermore, if you have backups of your data that you can quickly recover, you can't be the victim of extortion by ransomware attacks.

1. Identify what data you need to back up

Your first step is to identify your essential data. That is, the information that your school couldn't function without. Normally this will comprise of records, images, emails, contacts, and calendars, most of which are kept in just a few common folders on your network, computers, phones or tablets.

2. Keep your backup separate from your computer

Whether it's on a separate drive or a separate computer, access to data backups should be restricted so that they:

- are not accessible by staff
- are not permanently connected (either physically or over a local network) to the device holding the original copy.

Ransomware (and other malware) can often move to attached storage automatically, which means any such backup could also be infected, leaving you with no backup to recover from. For more resilience, you should consider storing your backups in a different location, so fire or theft won't result in you losing both copies. Cloud storage solutions (see below) can be a cost-effective and efficient way of achieving this.

3. Consider the cloud

You've probably already used cloud storage during your everyday work and personal life without even knowing - unless you're running your own email server, your emails are already stored 'in the cloud'.

Using cloud storage (where a service provider stores your data on their infrastructure) means your data is physically separate from your location. You'll also benefit from a high level of availability. Service providers can supply your school with data storage and web services without you needing to invest in expensive hardware upfront. Most providers offer a limited amount of storage space for free, and larger storage capacity for minimal costs.

Not all service providers are the same, but the market is reasonably mature and most providers have good security practices built-in. However, before contacting service providers, we encourage you to read the NCSC's Cloud Security Guidance.

4. Make backing up part of your everyday business

We know that backing up is not a very interesting thing to do (and there will always be more important tasks that you feel should take priority), but the majority of network or cloud storage solutions now allow you to make backups automatically. For instance, when new files of a certain type are saved to specified folders. Using automated backups not only saves time, but also ensures that you have the latest version of your files should you need them.

Many off-the-shelf backup solutions are easy to set up, and are affordable considering the business-critical protection they offer. When choosing a solution, you'll also have to consider how much data you need to back up, and how quickly you need to be able to access the data following any incident.

Protecting your school from malware

Your systems may be damaged, have access denied or even destroyed by the use of malicious software, known as malware, that can spread throughout a network.

Such incidents can incur expense in repairing damage to your schools computer systems including websites.

1. Install (and turn on) anti-malware software

Anti-malware (also referred to as anti-virus) software - should be used on all computers and laptops.

However, behaviour-based anti-malware software could also be considered. Many of the current applications rely on recognising the Malware from an extensive database and as a result it can only detect and stop what it knows. A number of ransomware variants have been seen that have been able to pass through without detection. Behaviour-based detection is an additional feature that some anti-malware providers offer and can stop ransomware when it attempts to encrypt your files.

2. Prevent staff from downloading potentially harmful apps

You should only download apps for mobile phones and tablets from manufacturer-approved stores (like Google Play or Apple App Store). These apps are checked to provide a certain level of protection from malware that might cause harm. You should prevent staff from downloading third party apps from unknown vendors/sources, as these will not have been checked.

Staff accounts should only have enough access required to perform their role, with extra permissions (i.e. for administrators) only given to those who need it. When administrative accounts are created, they should only be used for that specific task, with standard user accounts used for general work.

3. Keep all your it equipment up to date (patching)

For all your IT equipment (so tablets, smartphones, laptops and PCs), make sure that the software and operating system is always kept up-to-date with the latest versions from software developers, hardware suppliers and vendors. Applying these updates (a process known as patching) is one of the most important things you can do to improve security. Operating systems, programmes, phones and apps should all be set to 'automatically update' wherever this is an option.

At some point, these updates will no longer be available (as the product reaches the end of its supported life), at which point you should consider replacing it with a modern alternative.

4. Control how USB or cards drives can be used

We all know how tempting it is to use USB drives or memory cards to transfer files between pupils, teaching staff and the school. However, it only takes a single cavalier user to inadvertently plug in an infected stick (such as a USB drive containing malware) to devastate the whole school.

When USB drives or memory cards are openly shared, it becomes hard to track what they contain, where they've been, and who has used them. You can reduce the likelihood of infection by:

- blocking access to physical ports for most users
- using anti-malware tools
- only allowing approved USB drives or memory to be used within the school - and nowhere else.

5. Switch on your firewall

Firewalls create a 'buffer zone' between your school's network and external networks (such as the internet). Most popular operating systems now include a firewall, so it may simply be a case of switching this on.

Keeping your smartphones (and tablets) safe

Mobile technology is now an essential part of modern schools, with more of our data being stored on tablets and smartphones as well as Bring Your Own Device (BYOD) for students.

What's more, these devices are now as powerful as traditional computers, and because they often leave the safety of the office (and home), they need even more protection than 'desktop' equipment.

1. Switch on password protection

A suitably complex PIN or password (opposed to a simple one that can be easily guessed or gleaned from social media profiles) will prevent the average criminal from accessing the phone. Many devices now include fingerprint recognition or face recognition to lock the device, without the need for a password. However, these features are not always enabled 'out of the box', so you should insist they are switched on.

2. Make sure lost or stolen devices can be tracked, locked or wiped

Staff are more likely to have their tablets or phones stolen (or lose them) when they are away from the school or home. Fortunately, the majority of devices include free web-based tools that are invaluable should you lose your device. You can use them to:

- track the location of a device
- remotely lock access to the device (to prevent anyone else using it)
- remotely erase the data stored on the device
- retrieve a backup of data stored on the device

Setting up these tools on all your school's devices may seem daunting at first, but by using mobile device management software, you can set up your devices to a standard configuration with a single click.

3. Keep your device up-to-date

No matter what phones or tablets your school is using, it is important that they are kept up-to-date at all times. All manufacturers (for example Windows, Android, iOS) release regular updates that contain critical security updates to keep the device protected.

This process is quick, easy, and free; devices should be set to automatically update, where possible. Make sure your staff know how important these updates are, and explain how to do it, if necessary. At some point, these updates will no longer be available (as the device reaches the end of its supported life), at which point you should consider replacing it with a modern alternative.

4. Keep your apps up-to-date

Just like the operating systems on your school's devices, all applications that you have installed should also be updated regularly with patchs from the software developers. These updates will not only add new features, but they will also patch any security holes that have been discovered. Make sure staff know when updates are ready, how to install them, and that it's important to do so straight away.

5. Don't connect to unknown Wi-Fi hotspots

When you use public Wi-Fi hotspots (for example in hotels or coffee shops), there is no way to easily find out who controls the hotspot, or to prove that it belongs to who you think it does. If you connect to these hotspots, somebody else could access:

- what you're working on whilst connected
- your private login details that many apps and web services maintain whilst you're logged on.

The simplest precaution is not to connect to the Internet using unknown hotspots, and instead use your mobile 3G or 4G mobile network, which will have built-in security. This means you can also use 'tethering' (where your other devices such as laptops share your 3G/4G connection), or a wireless 'dongle' provided by your mobile network.

You can also use Virtual Private Networks (VPNs), a technique that encrypts your data before it is sent across the Internet. If you're using third-party VPNs, you'll need the technical ability to configure it yourself, and should only use VPNs provided by reputable service providers.

Using passwords to protect your data

1. Make sure you switch on password protection

Set a screenlock password, PIN, or other authentication method (such as fingerprint or face unlock). If you're mostly using fingerprint or face unlock, you'll be entering a password less often, so consider setting up a long password that's difficult to guess.

Having said this, password protection is not just for smartphones and tablets. Make sure that your office equipment (so laptops and PCs) all use an encryption product (such as BitLocker for Windows) with a PIN, or FileVault (on MacOS) in order to start up. Most modern devices have encryption built in, but encryption may still need to be turned on and configured, so check you have set it up.

2. Use two-factor authentication for 'important' accounts

If you're given the option to use two-factor authentication (also known as 2FA) for any of your accounts, you should do; it adds a large amount of security for not much extra effort. 2FA requires two different methods to 'prove' your identity before you can use a service, generally a password plus one other method. This could be a code that's sent to your smartphone (or a code that's generated from a bank's card reader) that you must enter in addition to your password.

3. Avoid using predictable passwords

Make sure staff are given actionable information on setting passwords that is easy for them to understand.

Passwords should be easy to remember, but hard for somebody else to guess. A good rule is make sure that somebody who knows you well, couldn't guess your password in 20 attempts. Staff should also avoid using the most common passwords, which criminals can easily guess. The NCSC has some useful advice on how to choose a non-predictable password.

4. Help your staff cope with 'password overload'

There's a number of things you can do that will improve security. Most importantly, your staff will have dozens of non-work related passwords to remember as well, so only enforce password access to a service if you really need to.

Where you do use passwords to access a service, the NCSC now recommend organisations should consider not forcing regular password expiry. They believe that it can reduce the vulnerabilities associated with regularly expiring passwords (the new password is often similar to the old one or may have been used elsewhere). Passwords may only need to be changed when you suspect a compromise of the login credentials. You should also provide secure storage so staff can write down passwords for important accounts (such as email and banking), and keep them safe (but not with the device itself). Staff will forget passwords, so make sure they can reset their own passwords easily.

Consider using password managers, which are tools that can create and store passwords for you that you access via a 'master' password. Since the master password is protecting all of your other passwords, make sure it's a strong one, for example by using three random words.

5. Change all default passwords

One of the most common mistakes is not changing the manufacturers' default passwords that smartphones, laptops, and other types of equipment are issued with. Change all default passwords before devices are distributed to staff.

Avoiding phishing attacks

In a typical phishing attack, scammers send fake emails to thousands of people, asking for sensitive information (such as bank details), or containing links to bad websites. They might try to trick you into sending money, or steal your details to sell on.

Phishing emails are getting harder to spot, and some will still get past even the most observant users.

1. Configure accounts to reduce the impact of successful attacks

You should configure your staff accounts in advance using the principle of 'least privilege'. This means giving staff the lowest level of user rights required to perform their jobs, so if they are the victim of a phishing attack, the potential damage is reduced. To further reduce the damage that can be done by malware or loss of login details, ensure that your staff don't browse the web or check emails from an account with administrator privileges.

An administrator account is a user account that allows you to make changes that will affect other users. Administrators can change security settings, install software and hardware, and access all files on the computer. So an attacker having unauthorised access to an administrator account can be far more damaging than accessing a standard user account.

2. Think about how you operate

Consider ways that someone might target your school, and make sure your staff all understand normal ways of working (especially regarding interaction with other schools), so that they're better equipped to spot requests that are out of the ordinary.

Think about your usual working practices and how you can help make these tricks less likely to succeed. For example:

- Do staff know what to do with unusual requests, and where to get help?
- Ask yourself whether someone impersonating an important individual such as the headteacher via email should be challenged (or have their identity verified another way) before action is taken
- Do you understand your regular school relationships? Scammers will often send phishing emails from large organisations (such as banks) in the hope that some of the email recipients will have a connection to that company. If you get an email from an organisation you don't do business with, treat it with suspicion.
- Think about how you can encourage and support your staff to question suspicious or just unusual requests – even if they appear to be from important individuals. Having the confidence to ask 'is this genuine?' can be the difference between staying safe, or a costly mishap.

You might also consider looking at how your outgoing communications appear to suppliers and parents.

Will your emails get mistaken for phishing emails, or leave people vulnerable to an attack that's been designed to look like an email from you? Consider telling your suppliers or parents what they should look out for (such as 'our bank details will not change at any point').

3. Check for the obvious signs of phishing

Expecting your staff to identify and delete all phishing emails is an impossible request and would have a massive detrimental effect on school productivity. However, many phishing emails still fit the mould of a traditional attack, so look for the following warning signs:

- Many phishing scams originate overseas and often the spelling, grammar and punctuation are poor. Others will try and create official-looking emails by including logos and graphics. Is the design (and quality) what would you expect from a large organisation?
- Is it addressed to you by name, or does it refer to 'valued customer', or 'friend', or 'colleague'? This can be a sign that the sender does not actually know you, and that it is part of a phishing scam.
- Does the email contain a veiled threat that asks you to act urgently? Be suspicious of words like 'send these details within 24 hours' or 'you have been a victim of crime, click here immediately'.
- Look out for emails that appear to come from a senior person within the school, requesting a payment is made to a particular bank account. Look at the sender's name, does it sound legitimate, or is it trying to mimic someone you know?
- If it sounds too good to be true, it probably is. It's most unlikely that someone will want to give you money, or give you access to some secret part of the internet.

Email filtering services attempt to send phishing emails to spam/junk folders. However, the rules determining this filtering need to be fine-tuned for your school's needs.

If these rules are too open and suspicious emails are not sent to spam/junk folders, then users will have to manage a large number of emails, adding to their workload and leaving open the possibility of a click. However, if your rules are too strict, some legitimate emails could get lost. You may have to change the rules over time to ensure the best compromise.

4. Report all attacks

Make sure that your staff are encouraged to ask for help if they think that they might have been a victim of phishing, especially if they've not raised it before. It's important to take steps to scan for malware and change passwords as soon as possible if you suspect a successful attack has occurred.

Do not punish staff if they get caught out. It discourages people from reporting in future, and can make them so fearful that they spend excessive time and energy scrutinising every single email they receive. Both these things cause more harm to your school in the long run.

If you believe that your school has been the victim of online fraud, scams or extortion, you should report this through the Action Fraud website. Action Fraud is the UK's national fraud and cyber crime reporting centre. If you are in Scotland contact Police Scotland on 101.

5. Check your digital footprint

Attackers use publicly available information about your school and staff to make their spear phishing messages more convincing. This is often gleaned from your schools website and social media accounts (information known as a 'digital footprint').

- Understand the impact of information shared on your school's website and social media pages. What do visitors to your website need to know, and what detail is unnecessary (but could be useful for attackers)?
- Be aware of what your partners, contractors and suppliers give away about your school online.
- Help your staff understand how sharing their personal information can affect them and your school. This is not about expecting people to remove all traces of themselves from the Internet. Instead support them as they manage their digital footprint, shaping their profile so that it works for them and the school.
- CPNI's Digital Footprint Campaign contains a range of useful materials (including posters and booklets) to help organisations work with employees to minimise online security risks.

3. Transfer the risk

Risk transfer is a risk management strategy that involves the contractual shifting of a risk from one party to another. One example is the purchase of an insurance policy, by which a specified risk of loss is passed from you to the insurer.

Cyber insurance acts as a safety net. As we mentioned, it's impossible to completely eliminate cyber risks even with sophisticated cyber security controls in place.

What does cyber insurance cover?

Ecclesiastical's cyber insurance for schools includes the following cover:

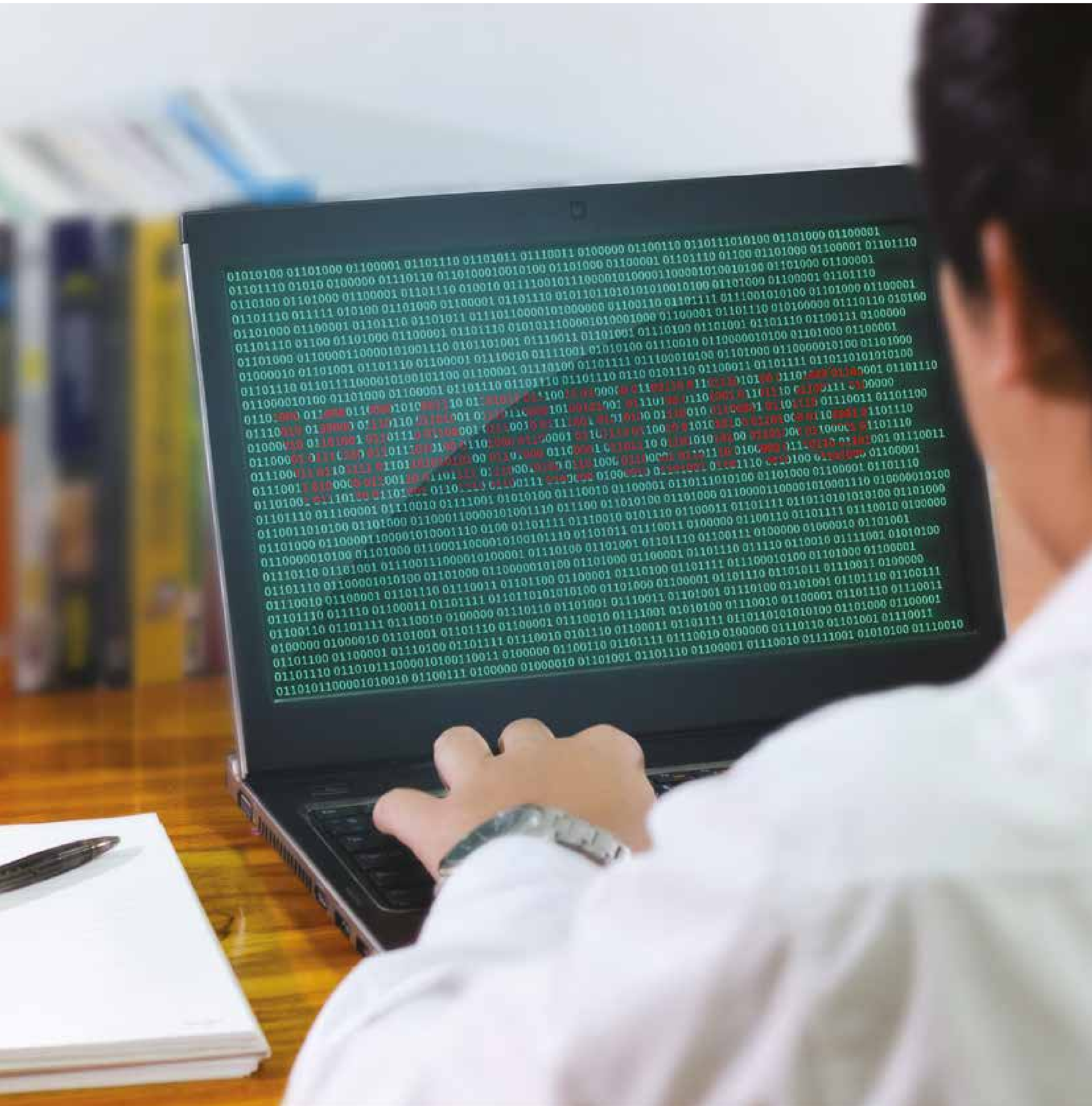
- Damage to computer hardware
- Restoration of lost or corrupted data
- Cover that helps schools with the impact of cyber crime such fund transfer fraud, computer enabled fraud or cyber extortion plus:
    - Network charges following telephone system hacking
    - Specialist support following a cyber extortion threat
- Costs of dealing with cyber liability claims plus:
    - Liability arising from libel/slander or loss of intellectual property rights
    - Onward transmission of malware
- Costs of dealing with data breaches (excluding legal fines)
    - Legal and forensic IT review
    - Notification costs to the regulator
    - Costs to provide ID assistance, credit monitoring and help lines to affected parties
    - Public relations and crisis management expenses
- Cover for school's fee income lost as the result of a cyber event.

It also includes access to expert advice and support when an incident occurs to help mitigate the financial impact or reputational damage.

4. Retain the risk

Planned acceptance of risks by excesses or deliberate non-insurance, where some, but not all, risk is consciously retained rather than transferred.

This is a good strategy to use for very low risks – risks that won't have much of an impact on your school if they happen and could be easily dealt with if or when they arise.



Useful links

www.actionfraud.police.uk
(The National Fraud & Cyber Crime Reporting Centre. Cyber crimes committed or attempted against you can be reported here. Also contains useful information on how to protect your school against fraud, scam emails etc)

www.ncsc.gov.uk/guidance
(Website for the National Cyber Security Centre, useful information on how to protect your school against common cyber threats)

www.gov.uk/data-protection/the-data-protection-act
(Overview of the Data Protection Act 1998)

www.ico.org.uk/for-organisations/data-protection-reform/overview-of-the-gdpr/
(Information about the General Data Protection Regulation (GDPR) affecting UK law from May 2018)

www.iso.org/isoiec-27001-information-security.html
(Website for the International Organisation for Standardization who developed ISO/IEC 27001:2013 referenced above)

www.riscauthority.co.uk/free-document-library/RISCAuthority-Library_detail.s28-cyber-crime-overview-and-sources-of-support.html
(Website for Riscauthority – free download document regarding cyber threats)

www.ncsc.gov.uk/cisp
(CiSP is a joint industry and government initiative set up to exchange cyber threat information in real time, in a secure, confidential and dynamic environment, increasing situational awareness and reducing the impact on UK business).

If you need to improve your cyber security further, then you can also seek certification under the Government's Cyber Essentials scheme, which has the benefit of demonstrating to both existing and prospective clients that you take the protection of their data seriously.

See **www.cyberessentials.ncsc.gov.uk** for more details.

If you are a larger school, or face a much greater risk from cyber crime, then the NCSC's 10 Steps to Cyber Security is a good source of information and can further enhance your approach to cyber security (**www.ncsc.gov.uk/guidance/10-steps-cyber-security**).

Compliance or alignment with a recognised standard, such as ISO/IEC 27001:2013 Information Security Management, can help you implement some of the above steps.

Notes

More than just insurance

With over 55 years spent securing the future of educational establishments, our education product and specialist service is tailored to give you peace of mind.

- A tailored insurance product that provides protection for staff, pupils, buildings, contents and business interruption.
- Access to helplines to support with PR and crisis management, legal advice and counselling.
- A bespoke risk management assessment, followed up with a risk tracker report, providing a before and after picture of risk improvements. Plus a unique view of where you sit in relation to your education establishment peer group.
- Access to our risk advice line providing quality support over the phone, helping you to manage your changing risks.
- Support from an award winning claims team[1] should the worst happen.
- Online advice via our “Education Hub”. Here you will find useful information ranging from staff training and health and safety advice, to easy to use forms and templates and market insights.
- A 25% discount for EduCare, a leading provider of online duty of care and safeguarding training[2].

Visit **www.ecclesiastical.com/education** for further information on education insurance from Ecclesiastical.

[1] Winner at the Insurance Times Claims Excellence Awards and the Post Claims awards 2018.

[2] To claim the 25% discount you must have an active education policy with Ecclesiastical Insurance Office plc on the date of purchase. This discount cannot be used in conjunction with any other offer.

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