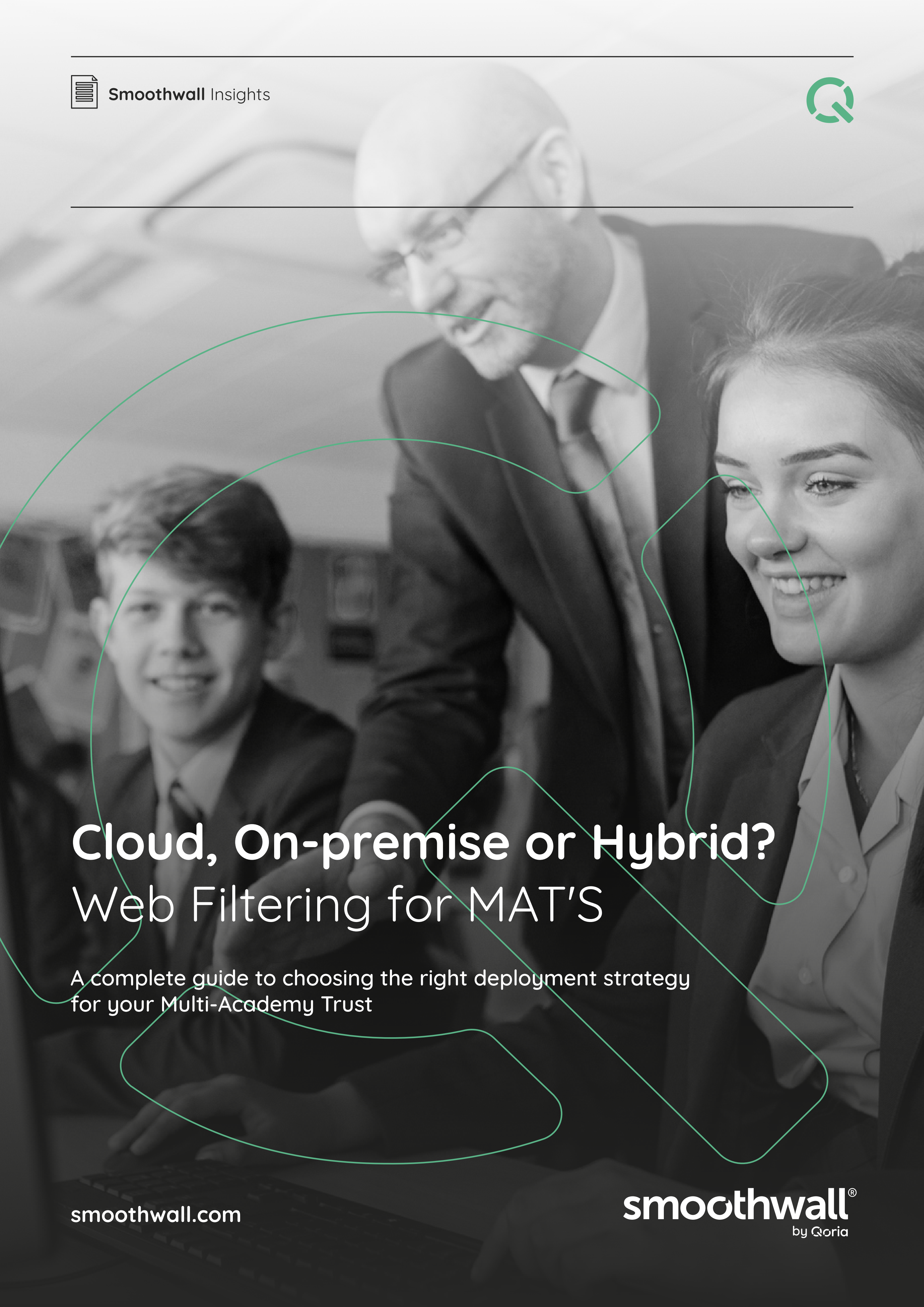
Smoothwall Insights



Cloud, On-premise or Hybrid?

Web Filtering for MAT'S

A complete guide to choosing the right deployment strategy for your Multi-Academy Trust

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Contents

Introduction

Our aim in this paper is to give you a better understanding of the deployment options around web filtering and to achieve a more informed allocation of resources.

We expand on the on-premise versus cloud debate and share perspectives on why some school IT leaders are choosing to follow a hybrid model where on-premise and cloud computing coexists.

Essential reading for: IT/ Network Managers and technicians working within UK Multi-Academy Trusts. Also, Headteachers and DSLs wanting a more practical understanding of their IT environments as it relates to safeguarding.

If you have any questions about web filtering, its implementation or digital safeguarding in general, please contact us. We're ready to help.

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2.0 The Changing Face of Web Filter Deployment

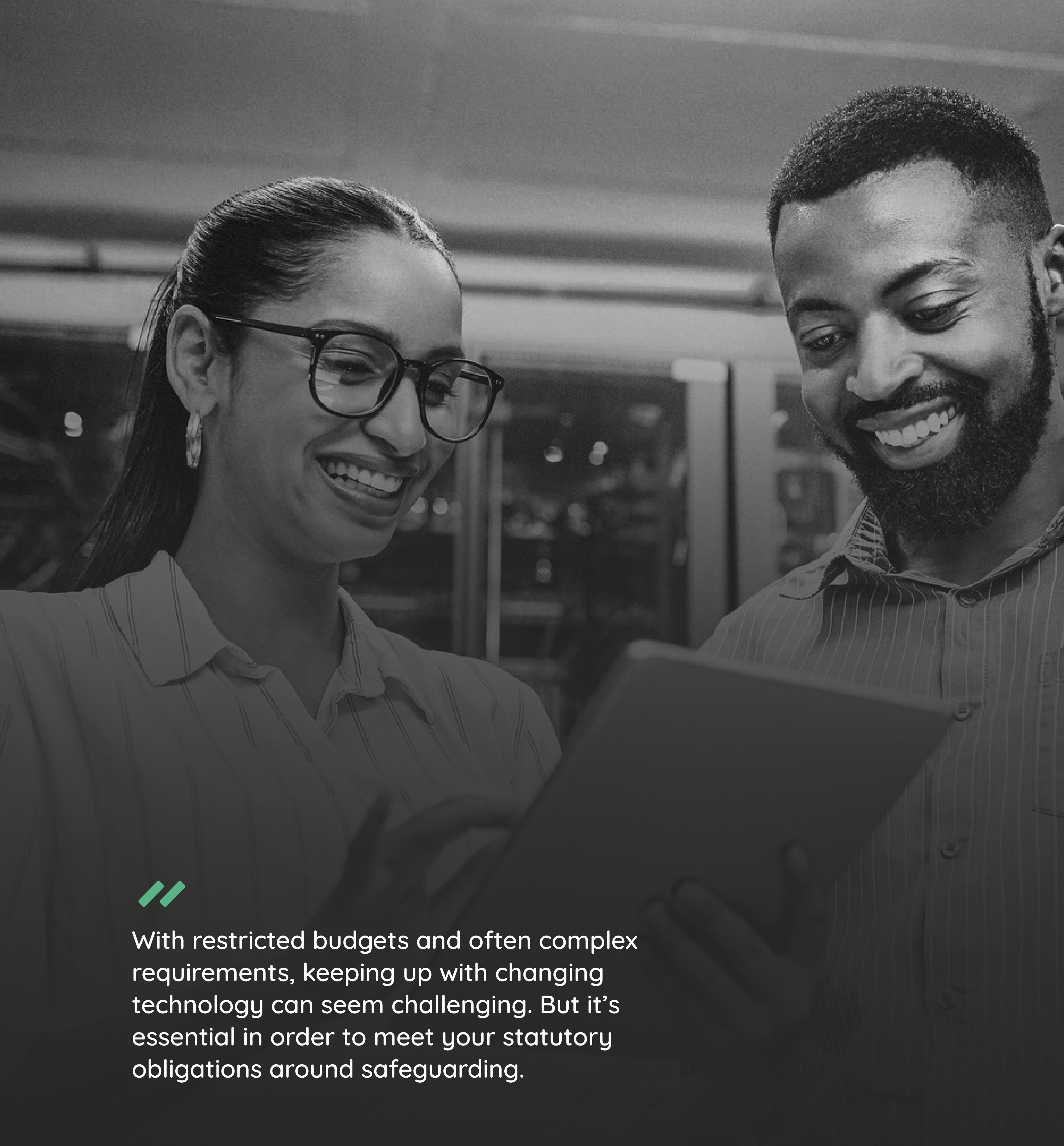
The online world in education is rapidly developing. Deployment options are expanding and cloud-based web filtering is becoming more common than ever before.

Indeed, many schools have chosen to ditch their on-premise environments altogether.

There are, however, valid reasons why a Multi-Academy Trust (MAT) might choose to stay with their traditional onpremise system; which has been the norm in UK education until very recently.

Major technology vendors emphasise the benefits of storing data and running applications, platforms and infrastructure in the cloud - whether public or private. But many IT leaders, including Network Managers, remain caught in the debate over maintaining on-premise data centres versus moving to the cloud.

With restricted budgets and often complex requirements, keeping up with ever changing technology can seem challenging for MAT leaders but it's essential in order to meet many of your statutory and organisational obligations, especially around safeguarding.



> With restricted budgets and often complex requirements, keeping up with changing technology can seem challenging. But it’s essential in order to meet your statutory obligations around safeguarding.

2.1 Web filtering in the cloud

Types of cloud filter:

DNS filter

Easily deployed but deficient in an education setting, the DNS filter can block sites at domain level.

Public cloud pass-through proxy

Increasingly rare in Education, these are traditional proxies which work in public cloud data centres and can suffer from bandwidth tromboning, poor latency performance and high running costs.

Private Cloud MAT or LEA hosted pass-through proxy

When MATs or other organisations have a centralised IT provision, it often makes sense to centralise filtering, especially if the organisation makes use of an MPLS network or SD/WAN to manage connectivity between sites.

Client-led cloud filter

Cloud managed, but with much of the heavy lifting done on-device, these filters work best with managed devices and offer none of the drawbacks of earlier types of cloud filtering.

This report will focus on the client-led cloud filter, and MAT/Private cloud as DNS is generally not considered a suitable deployment option for an education setting.

Public cloud pass-through can also have cost implications that can preclude it from all but the most specialist markets.

Client-led cloud filtering enables you to remove filtering from your on-site server and apply it directly to your client machines. This gives you more freedom in how you filter managed devices and is particularly useful when you have devices going off-site. It also gives the benefits of faster internet access and more comprehensive data reporting.

Cloud Filtering gives you more freedom in how you filter managed devices.

Cloud filtering has many benefits to suit your Multi-Academy Trust's needs:

- **Student safety** - Allows you to provide filtering both on and off-site and is less restricted by server dependency. This is particularly useful for 1:1 programmes. Additionally, students tethering devices to hotspots are filtered 100%.
- **Fast investigative reporting** - Cloud provides faster reporting than on-premise solutions as it eliminates the need for an appliance to process large volumes of data. Faster reporting means faster follow up on issues.
- **Fast internet access** - Gives pupils and staff fast access on any device. The simplification of authentication of users also makes for a more streamlined process.
- **Fast deployment** - Removes the need for the installation of complicated hardware, or staff training, to get it onsite and working speedily.
- **Lower IT maintenance** - With the cloud hosting your filtering maintenance time is reduced, giving valuable hours back to your IT team.
- **No capital expenditure** - Eliminates the need to purchase and maintain expensive servers upfront. Cloud filtering allows you to subscribe for exactly what you require over time.
- **Scalability without new appliances** - The cloud is a dynamic solution that allows your school or college to expand or contract quickly, ensuring optimisation for current usage.
- **Always latest edition** - Cloud filtering will always run the latest version without the need for running updates on servers.
- **No bottlenecks avoiding choke points** - Cloud filtering happens at device level and so activity is distributed across all devices.
- **Security** - Data in the cloud is encrypted and held on remote, physically secure sites.
- **Back-up of data** - Cloud services are much more likely to have easy recovery of any lost data.
- **Simplified content filtering** - Some solutions allow you to achieve real-time, content aware filtering without the complexity of man-in-the-middle (MitM) decryption, certificates or exceptions.
- **Lower energy costs** - With no need for high power servers to run, energy bills can reduce.

2.2 Traditional on-premise

Most education IT Managers are familiar with installing their web filter on their school or college's own computers and servers. In many cases, on-premise systems are easier to modify and an ability to customise to specific needs is important for an organisation.

On-premise web filtering puts more control in your hands up to and including the security of your data. It's therefore essential that your organisation is capable of safeguarding its most sensitive information which can be a frequent target of cyber-criminals.

Filtering on BYOD can often pose an issue for institutions. On-premise delivers the best option for creating effective BYOD functionality.

On the face of it on-premise web filtering may be better suited for larger MATs with higher budgets; a desire to customise system operations; and the existing infrastructure to host, maintain and protect its data.

The benefits of on-premise filtering:

- Budgets for improvement - Your organisation may have separate budgets for significant infrastructure changes. A major on-premise filtering purchase might not have to come from your mainstream IT budget.
- Cost upfront/subscription - With most of the cost arising from the initial outlay, institutions that use systems for long periods of time may calculate a smaller overall spend than a regular subscription service.
- Data security - Data security remains in the hands of your schools. This can give peace of mind provided you have adequate protection in place.
- Customisation - Deployment may take longer but it allows you to add more customisation to your infrastructure. This can benefit you if your Trust has large or complex systems.
- Existing infrastructure - The DfE advises institutions to review their current infrastructure and existing contracts carefully to make sure introducing cloud will not result in a duplication of cost.

> Perfectly workable local solutions should not be retired before their natural end of life"

- Being ready - Big changes to infrastructure and systems can be another upheaval in times of other change. It may not be the right time for your Multi-Academy Trust to consider a complete systems overhaul.
- Extra training of staff - Existing IT staff will need to understand the system changes for moving over to cloud. This will involve extra training and may require extra support initially.
- BYOD & unmanaged devices - On-premise can be the best solution for protecting on-site BYOD devices. Additionally, other unmanaged devices are easily handled at the network level.
- Control - Your MAT may want to retain total control over your filtering set-up.
- Consolidation - Filter appliances might double up as firewalls, saving money, and maintaining the same consumption power, cooling and rack space.
- Assured filtering - With a filter inline on your network, it's much more difficult for a device to escape filtering, whether it's by mistake or through nefarious means.

2.3 Hybrid deployment

While the debate of the pros and cons of an on-premise environment pitted against a cloud computing environment is a real one, there is another model that can offer the best of both worlds.

A hybrid solution features elements of both on-premise and cloud, and can leverage the benefits of both.

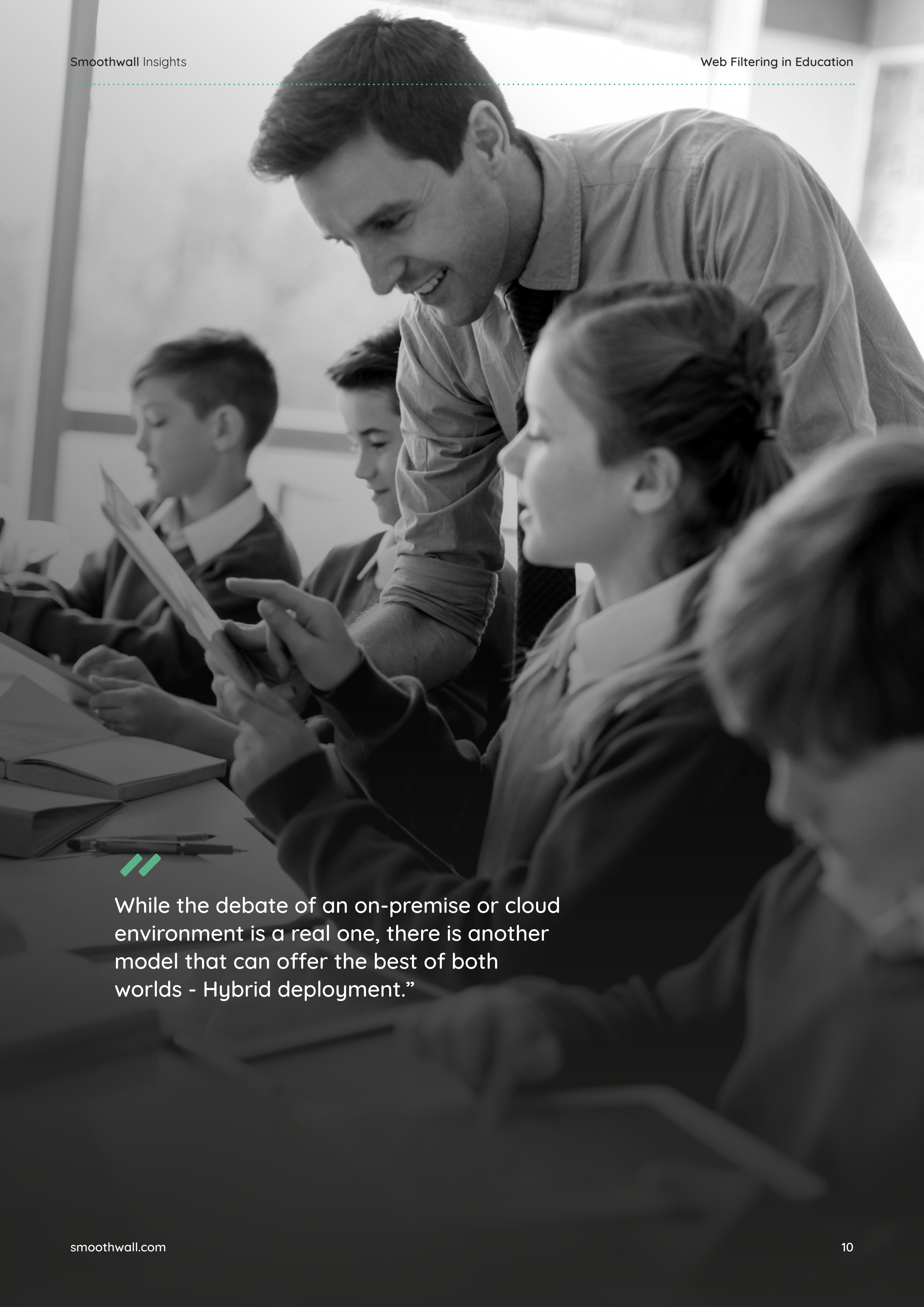
Usually such a deployment retains a less powerful hardware appliance on-site and is combined with client deployment for a proportion of student systems. Sometimes these deployments start heavily skewed towards the existing on-premise solution where an organisation is migrating to a more balanced hybrid setup. On-premise systems are generally considered a capital expenditure whereas cloud-based systems are typically considered an operating expenditure.

> While the debate of an on-premise or cloud environment is a real one, there is another model that can offer the best of both worlds - Hybrid deployment."

How might a hybrid deployment work for filtering?

A hybrid solution can be the best solution for some schools, colleges and trusts if you are concerned about any of the following:

- Load distribution - As internet traffic increases, the need for powerful filter hardware can arise. With bandwidth ever cheaper, it can prove expensive to keep up. Cloud filtering can alleviate the bottleneck at the gateway edge and extend the capability of more modest hardware.
- Authentication - By introducing the cloud solution for some devices, you can remove the need for additional authentication methods, particularly for modern devices such as Chromebooks, improving the accuracy of filtering and logging, and ultimately improving safeguarding outcomes.
- Managed devices off-site - There is a growing need for schools and colleges to filter managed school devices off-site. If that applies to you and you wish to still retain your on-premise filtering model, a hybrid solution will allow you to add a cloud solution to all devices that go off-site and may be an ideal option.
- Flexibility - A hybrid solution can provide your institution with the flexibility to match evolving needs. For example, you may wish to choose how to distribute depending on available resources. Or you may be a MAT planning to roll out programs such as 1:1 across your schools which will involve adding more devices over time. Hybrid can be ideal for meeting flexible and changing requirements.
- BYOD - Some of your schools require the benefits of cloud but also want the most effective filtering for BYOD. Hybrid allows you to achieve both scenarios.



While the debate of an on-premise or cloud environment is a real one, there is another model that can offer the best of both worlds - Hybrid deployment.”

3.0 Statutory Requirements & Guidelines

When reviewing your filtering arrangements for your MAT, it is a good idea to **revisit the statutory requirements and guidelines** to ensure you are up to date.

Ofsted inspections will expect to see:

- “Appropriate filters and monitoring systems.. in place to protect children from potentially harmful content, and regularly review their effectiveness.[1]

The Keeping Children Safe in Education (KCSIE) statutory document explains this requirement in detail by mentioning:

- Filtering should be “appropriate” for the individual school or college’s needs.
- Overblocking should not lead to “unreasonable restrictions” as to what children can be taught with regard to online teaching and safeguarding.

These requirements make it clear that whilst it is essential for schools and colleges to create optimum protection from the safeguarding and security risks that the internet exposes, there is an expectation for establishments to ensure that their filtering provides a granular approach that allows appropriate access whilst also not enforcing unreasonable restrictions.

[1] Ofsted Safeguarding in the Early Years. 2022. hhttps://www.gov.uk/government/publications/inspectingsafeguarding-in-early-years-education-and-skills/inspecting-safeguarding-in-early-years-education-and-skill

[2] UK Safer Internet Centre. 2022. https://saferinternet.org.uk/guide-and-resource/teachers-and-school-staff/appropriate-filtering-and-monitoring/appropriate-filtering

UK Safer Internet Centre

KCSIE points to the UK Safer Internet Centre[2] for schools and colleges to refer to when choosing their filtering solution. Within this guidance it is suggested that all schools and colleges should have effective monitoring that identifies both illegal and inappropriate content.

The definitions for measurement include:

Illegal content

- Illegal images - Providers should be members of the Internet Watch Foundation (IWF). Access is blocked to illegal Child Sexual Abuse Material (CSAM)
- Unlawful terrorist content - Providers should Integrate the 'police assessed list of unlawful terrorist content, produced on behalf of the Home Office'

Inappropriate content

- Discrimination: Any form of unjust or prejudicial treatment of people with protected characteristics of the Equality Act 2010.
- Drugs / substance abuse: Anyone displaying or promoting illegal use of drugs or substances.
- Extremism: Anyone promoting terrorism and terrorist ideologies, violence or intolerance.
- Malware / hacking: Anyone who promotes the compromising of systems including anonymous browsing and other filter bypass tools as well as sites hosting malicious content.
- Pornography: Displays of sexual acts or explicit images.
- Piracy and copyright theft: Illegal provision of copyrighted material.
- Self-harm: Promotion or display of deliberate self-harm (including suicide and eating disorders).

Key features

The UK Safer Internet Centre suggests a solution should meet the following:

Age appropriate, differentiated filtering	Can the provider supply a granular solution that allows you to vary filtering strength appropriate to age and role?
Control	Can the solution allow you control of your filtering to permit or deny access of content?
Circumvention	Does the solution have the extent and ability to identify and manage technologies and techniques used to circumvent the system, for example VPN, proxy services and DNS over HTTPS?
Contextual Content Filters	In addition to URL or IP based filtering, what extent can content be analysed as it is streamed to the user and blocked. For example, can it contextually analyse text on a page and dynamically filter it?
Filtering policy	Does the provider publish a guide as to their approach of categorisation and classification including approach to over-blocking?
Group / Multi-site Management	Does the solution have the ability for deployment of central policy and central oversight or dashboard?
Identification	Will your solution allow you to identify users accessing your network?
Mobile and app content	Will the solution cover mobile and app connections?
Multi-language support	Will the solution cover the relevant languages required for your school?
Network level	Will the filtering be applied at network level and not be reliant on software on user devices?
Remote devices	Does the solution have the ability for devices to receive school based filtering to a similar quality to that expected in school?
Reporting mechanism	Does the solution have the ability to report inappropriate content for access or blocking?
Reports	Can the system offer clear historical information on the websites visited by your users?

4.0 Choosing the Right Deployment Strategy for your School/College

With more and more software migrating to the cloud and the clear benefits that brings, a natural progression for many schools will be migrating to cloud filtering or hybrid over the next few years. That said, on-premise is unlikely to disappear altogether and there are valid reasons why a school/college may wish to stick with their on-premise set up.

4.1 Where are you now in your filtering roadmap?

The following table offers some points to consider when considering your deployment strategy.

Current needs	Possible solution	Solution detail
You are a school/college that has heavily invested in an on-premise solution. You have the staff available to maintain and manage this equipment. You want to have full responsibility over your system and data, you don't mind completing updates on your devices, and do not want to overhaul a system that is mainly reliable with some tweaking.	**Traditional: On-premise**	Updating your on-premise solution may be the right place for you now. You're aware that cloud is coming and that you need to move to it in the future, but you would like to wait for cloud filter solutions to be more established.
You are a school/college that has good on-premise equipment but is noticing gaps in some of the filtering requirements you need. You have available staff to maintain the equipment but need to find a solution that will cover these gaps. You need to keep costs to a minimum and need a solution that can cover your changing environment.	**Hybrid: Traditional on-premise combined with cloud add-on**	A hybrid solution can allow you to retain your functioning on-premise solution but create an add-on using a cloud solution on top. This can be an easy fix to your situation without having to do a big overhaul of your solution yet. You can gradually progress over to the cloud, giving you time to plan for meeting all your complex requirements through the cloud exclusively. By using a combination of on-premise and the cloud, you will be able to make better cost efficiencies while simplifying management and improving your filtering's overall performance.

Current needs	Possible solution	Solution detail
You want to overhaul your filtering system and bring your school/college fully into the modern IT environment. You don't want to have a huge capital expenditure outlay and are looking for a solution that makes costs more manageable and subscription based. You want to be able to have flexibility in your offering as your device requirements are changing with different numbers of students and everincreasing devices. You want a no-nonsense solution where your data is protected. You want to reduce the need for running updates to the latest version, freeing you up for the vast amounts of other IT demands that need to be acted upon. You want to avoid bottlenecks with your vast datasets which can be hard on your processors and affect the speed of your reporting. You have overwhelmingly managed devices and no BYOD.	Cloud: Advanced all in the cloud filtering	Installing a fully cloud-based solution will enable you to create a filtering infrastructure designed for future years. A cloud solution will enable you to manage filtering costs over time without significant upfront expenditure in on-site equipment. The IT infrastructure will be simplified without the need for complicated configuration. The way a cloud solution works will enable you to keep your solution flexible so that you can scale up or change flexibly over time rather than having to plan for all eventualities on day zero. Data in the cloud is normally encrypted and stored in a remote and physically secured site. This is likely more secure than you can achieve on your school or college site. There will be no need for updates as the cloud will automatically run the most current solution. Cloud computing allows filtering to occur at device level and so activity is distributed across every device avoiding bottlenecks.

5.0 How to Choose a Vendor

When choosing a vendor, it is important to choose a solution that covers all the requirements as set out in KCSIE and the UK Safer Internet Centre guidance.

Looking for a vendor that is established and a specialist in solutions for schools, colleges, trusts and local authorities is a good starting point. Asking the vendor how they are able to meet the guidelines will give you a good understanding of whether they are aligned with government signposted requirements.

5.1 Checklist of functionality

Real-time content analysis filtering

Ensure their solution does not just use a URL block list, but instead uses real-time content analysis to look at pages objectively and avoid unnecessary blocking or missing any pages that should be blocked. For example, a provider that categorises content by analysing the content, context and construction of individual pages is much more effective at finding and blocking inappropriate content without overblocking entire sites. Relying on URL block lists also often means subdomains are not included in the filtering provision – a key and growing concern amongst teachers.

Powerful real-time reporting

Look for a provider that offers timely reporting. There is little point finding out about an incident days after the event.

On/off-site protection

Make sure if you have any managed student devices, you have the option for them to be filtered off-site. Check to see if there is granularity in this.

Full incident reporting

Make sure your provider is able to report on 100% of the data created. This will help build a full contextual picture of an incident.

Authentication

Look for a simple authentication process which makes access smoother and the ability to track all users easier.

Social media controls

Check that the solution gives you options around social media including read-only access.

Anti-malware

Ensure the solution covers protection against malware and ransomware threats.

Support

Look for a provider that offers a reliable support service operating in times that suit your time of day.

5.1 Checklist of functionality cont.

Data security	Ensure that any vendor understands the specific requirements around school data and has the correct DfE certification.
Easy bandwidth management	Make sure the solution will enable you to control and allocate bandwidth to allow media and file-sharing.
Layer 7 application control	Check the solution will enable you to identify and stop applications you don't want to run on your network and prioritise the ones you do.
Anonymous proxy blocking	Look for a simple authentication process which makes access smoother and the ability to track all users easier.
Age appropriate	Look for filtering providers that use a wide variety of directories (e.g. Microsoft AD, Google Directory) allowing filtering to be set appropriately at group and user level.
Simplified configuration	Sometimes elements of on-premise solutions can make filtering more complex than it needs to be. Cloud filtering simplifies the approach making filtering easier to configure and less likely to fail. For instance, some cloud filtering solutions are able to analyse content in real-time without the need to add on-premise additions including man-in-the-middle decryption, certificates or exceptions.
Multiple options	Make sure you choose a vendor that can look for a solution that suits you. A good vendor will be able to look at your needs and provide a tailored solution to meet all your requirements. All institutions are different. Some may want a full cloud solution; some may want a hybrid solution.
Deployment	Check that the speed of deployment and the resources you will need on-site match up. Many cloud solutions tend to have a faster set-up than on-premise. Less configuration and equipment on-site often make cloud filtering a speedy process.
Scalability	Check that your solution will easily expand or contract depending on your ever-changing needs. Adaptability is key for a long-term solution.
Vendor reviews	Look for providers that can show you an established history in providing filtering for UK education. Often new players may offer the world as they do not fully understand the needs and challenges of filtering in education and may not be able to deliver what they are promising.

> “If your solution relies on a URL block list it often means subdomains aren’t included in the filtering provision - a key and growing concern amongst teachers. ”

6.0 Frequently Asked Questions

Why do we need to filter devices off-site?

One of the concerns parents have when schools look to introduce 1:1 programmes are the protection of the devices when they are in the home environment. They want you to offer peace of mind that you have the risks covered in and outside of school. Students are more likely to try to take risks outside of the classroom environment.

Will my data be secure in the cloud?

With schools and colleges being vulnerable targets for sensitive data theft, data security is paramount. Most providers using the cloud are likely to suggest that using the cloud is more secure than on-site. Smoothwall uses Microsoft Azure – some of the most certified and secure datacentres, with tried and tested software.

Is cloud filtering more expensive?

Most cloud filtering solutions will give you a more costefficient set-up and allow you to plan for your budget by regular payment options rather than initial large upfront cost. This gives you the flexibility and ease to change your set-up over time.

Is on-premise more customisable?

In complex or large systems, on-premise or hybrid solutions can give institutions more detailed customisation options.

Have a question that's not answered here?

Contact our web filter experts.
We'll be happy to help.

Tel: +44(0) 800 047 8191
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Will a cloud solution be scalable?

One of the main reasons so many solutions are moving to the cloud is the fact that cloud solutions are easy to adapt to your current needs. Many providers operate in bands of users with the possibility to change your band over time.

Will cloud filtering make my old equipment redundant?

Not necessarily. If you have invested in expensive equipment, a hybrid model could add the aspects you currently need without replacing equipment that is working for you.

How quickly can cloud filtering be deployed?

Depending on the provider, most good solutions will significantly reduce the time for deployment from weeks to days.

How can I check that a cloud filtering solution doesn't create over-blocking?

Look for providers that use highly granular categorisation and assess the content of pages. Leading providers like Smoothwall have intelligent rules-based mechanism that allow sites to be more accurately classified and filtered upon, without unduly restricting access.

7.0 About Smoothwall Filter

At Smoothwall we know that schools' needs are changing. We know that the internet is now an integral part of school life and that the need for **flexibility and mobility of devices is increasing.**

Varying requirements mean schools and colleges may need a variety of solutions.

We have added Smoothwall Cloud Filter and Hybrid deployment to our on-premise offering, to meet these needs and enable you to take your web filtering to an advanced level. No longer are you restricted to filtering only on-site or the speed in which your filtering can be deployed.

The added benefits that Cloud Filter offers are:

- Filtering devices both on and off-site.
- Flexibility and easy scalability so that your needs can be met overtime.
- Simpler configuration without the need for man-inthe middle, certificates or exceptions to use real-time content analysis.
- 100% time-line reporting meaning that a full contextual picture can be created around incidents.
- Side-stepping choke and throughput issues.
- Faster installation process and more robust user authentication.
- Security of data encrypted within remote, physically secured sites.

Other key elements offered by Smoothwall Filter include:

Real-time dynamic content analysis: Smoothwall provides filtering and reporting that analyses and categorises web content in real-time. This gives schools better protection as URL blocklists often become outdated.
Social media controls: You may want to allow access to social media in your school environment but control how much activity can take place. Smoothwall filtering allows you to have flexible options including creating read-only settings or allowing you to remove inappropriate content from school site.
Gateway anti-malware (on-premise only): Whether a user opens something by accident or deliberately tries to access something containing malware, this anti-malware will protect your school or college from the malware and ransomware threats.

Layer 7 application control (on-premise & hybrid only): You can choose which applications you want to prioritise on-site and remove applications you don't want on your network.

Easy management (on-premise): Easy bandwidth management and allocation means you can minimise the impact when departments need high media usage or file sharing.

Anonymous proxy-blocking (on-premise): When students/staff try to circumvent your filtering by using proxy servers, this can be blocked in real-time.

Next generation firewall (on-premise & hybrid only): Protect yourself from all web and non-web borne threats by monitoring all incoming and outgoing traffic.

Appendices

Further reading

Safeguard Monitoring: A Complete Guide to Active Monitoring for Schools

What is monitoring, why do Ofsted require it, and how can you integrate it into a busy safeguarding strategy.

Available at: https://smoothwall.com/active-monitoring-schools

Safeguard Monitoring: How to Prepare Your Case for Funding

A step by step guide for DSLs, Head Teachers, Principals and anyone responsible for ensuring a compliant digital monitoring provision within their School.

Available at: https://smoothwall.com/how-to-create-a-case-for-funding

Benchmarking Your Digital Safeguarding: How to Create an Improvement Strategy for Ofsted

A practical guide for school/college Headteachers, Principals, DSLs and anyone responsible for digital safeguarding in an education setting.

Available at: https://smoothwall.com/benchmarking-digital-safeguarding-ofsted

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Smoothwall is the leading provider of digital safeguarding solutions in UK education. For more information, visit our website or get in touch with our team of experts.

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Qoria

Smoothwall is part of Qoria, a global technology company, dedicated to keeping children safe and well in their digital lives. We harness the power of connection to close the gaps that children fall through, and to seamlessly support them on all sides - at school, at home and everywhere in between.

Find out more
www.qoria.com