

Assessing your school infrastructure and planning for investment: a guide for headteachers and SBMs

Your school needs a reliable and functioning IT system to enable teaching and learning, meet day-to-day admin requirements and support your vision and ethos. When technology and pedagogy are joined up, extraordinary learning takes place. With our background in both teaching and tech and reputation for impartial, expert advice, we can help you make sure your IT is supporting your school, not holding it back.

Overview

There are six essential areas you need to get right when you're planning to invest in your school's technical infrastructure. We can help you make the right decisions for your school.

1. Speed and reliability

Get the foundations of your IT system ready – the servers, switches, cabling and bandwidth – and you can be confident that your network will stay working without any bottlenecks and with plenty of room to expand. Investment in your network behind the scenes will ensure it works front of house in the classroom.

2. Fast, robust wifi

If your school is planning to make the most of tablets, laptops and other mobile devices and move learning with technology from the IT suite into the classroom, a robust managed wifi network is a prerequisite. It needs to be able to load balance the demands from devices throughout the school and be capable of creating a separate guest wifi network if parents and visitors need access, too.

3. Secure and stable operating systems

Schools should make sure computers are running Windows 10 and where possible have SSD hard drives for performance and speed. There are other specifications that can make a huge difference to the all-round user experience and we can advise which features to invest in as a base level for new purchases.

4. Making the most of mobile devices for learning

iPads or Chromebooks? Each has their advantages, from iPad access to education-based apps in Apple's app store to Chromebook, Google's robust, value for money alternative. As independent advisers, we can talk you through the pros and cons and help you make an informed choice.

5. Better, brighter interactive screens

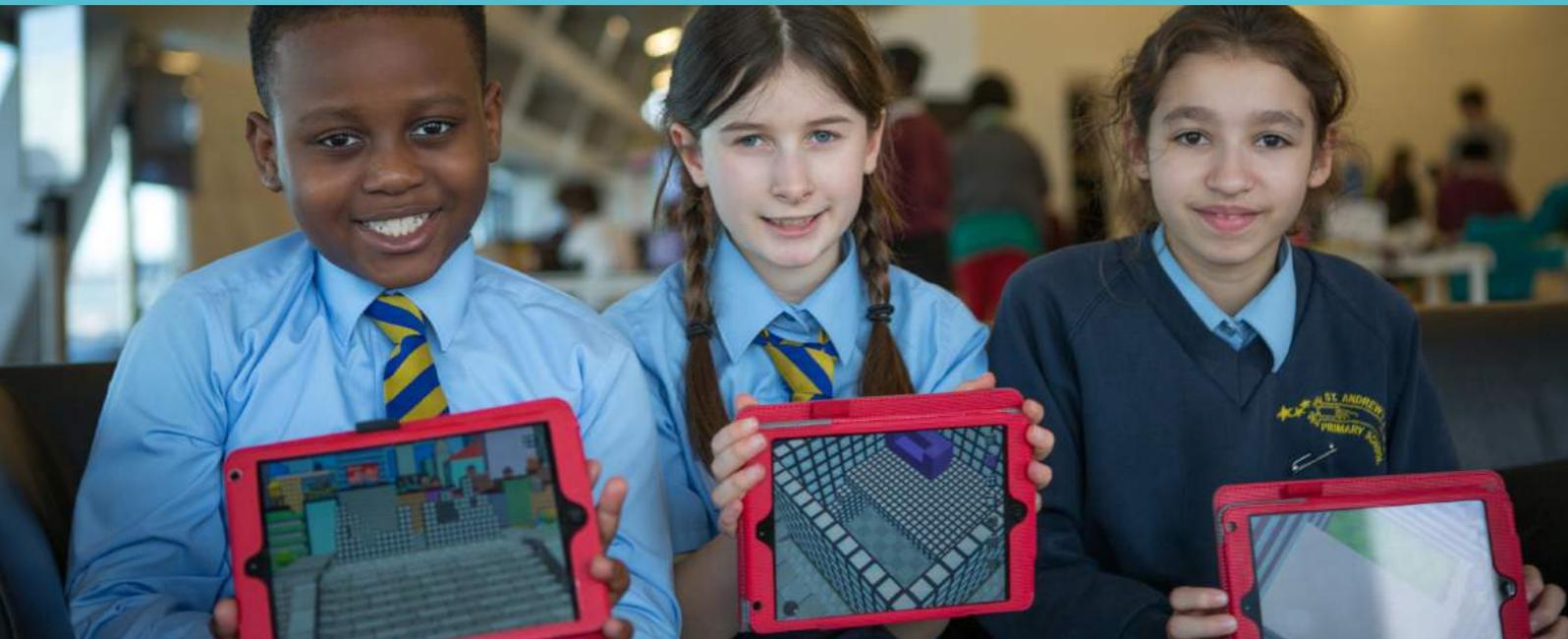
Projectors, with all their associated health and safety risks, have no place in today's classroom. Consider LED screens, which provide an all-in-one solution for display, interactivity and sound and last around 20 years.

6. Trusted and effective support

Is your school technician approachable, reliable and impartial? They should be. Unlike many IT technical advisors we're completely independent. That means we offer impartial advice and the best value-for-money solution to your IT needs rather than the one that earns the most commission. Schools build up a personal relationship with our technicians, confident in the knowledge that they really understand both IT and teaching and learning in a school context.

“ London CLC are the best technical and curriculum support team I have worked with in the 15 years I have been involved in education. Their expertise, enthusiasm and patience has led them to them creating a safe, supportive environment for our children and staff to develop and learn. They manage to make the complex world of technology as simple as possible! We have recently adopted CLC as our technical support team and they have already made a huge impact; updating our infrastructure to improve outcomes for our children, guiding us through the process of becoming a Google for Education setting and being patient and calm in the face of a wide range of technical issues along the way. Their team are so knowledgeable and at the cutting edge of the world in which they work, and we feel secure in the knowledge that they are with us. London CLC just get it right. We are very lucky to have them and I would greatly recommend their services ”

Deputy Head and Computing Subject Leader, St Jude's CofE Primary School



Find out more about each of these critical areas below.

Core infrastructure - servers, switches, cabling, and bandwidth

The backbone of your school's computer network is its infrastructure. The speed and efficiency of a school system is dependent on the reliability and quality of the servers, cabling and switches that sit at the heart of the network. Similarly, the speed and reliability of access to external web services and cloud-based technologies, such as Google Apps, will be governed by the amount of internet bandwidth provided by your internet service provider (ISP). This is why investment in the

behind-the-scenes of your network should always be considered when thinking about IT expenditure.

Servers should have a minimum of an eight core processor with at least of 32GBs of RAM. Schools should aim to invest in at least 2-4TBs of network storage, with anything above this highly recommended in order to future proof the system. Windows Server 2012 R2 is the minimum level of server operating system that a school should use. However, schools should consider upgrading to 2016 as soon as possible, to take advantage of the latest security and feature developments, along with ensuring adequate support for the lifetime of the servers.

Schools should aim to operate with at least two servers, so that if one server goes down, the other can be configured to take over its responsibilities, allowing continued access to essential services at all times. Ideally, migrate your third party software to the cloud instead of keeping it on your servers. If this is not possible, a third server (either virtual or physical) should also be considered to host your third party software such as door entry management systems/finance/MIS packages. If work needs to be carried out on any of these third party services, this can be managed without impacting on any other school services.

All **switches** used within your school's network should be rated at a speed of at least a Gigabit. This includes fibre links and conversion boxes between buildings on a school site. Some schools still use slower Fast Ethernet systems (which run at 10% of the Gigabit speeds) but this will not be good enough for the explosion of rich digital content (eg high definition videos), and running cloud software smoothly and with no delay. If multiple switches/cabinets are used in a school, the connections between them should be linked using fibre (SFP modules and fibre optic cables), as they are faster and more reliable than the widespread Ethernet to fibre converters, used in many schools.

Cabling, at the very least, should be at a Cat5e standard (new-build primaries should use Cat6) with full documentation, a complete visual diagram and comprehensive testing and labelling of wall sockets, patch panels and links. This enables a school to identify and troubleshoot network outages as a result of poor or broken cabling, faulty switches, loops or other faulty devices.

If work is done on your network by your technician or other suppliers make sure you securely store any plans, diagrams and other documents relating to cabling and the network. You are well within your rights to demand such documentation if you are not

provided with them after the completion of any work. This should save time and money if any work needs to be done on your network in the future.

Internet bandwidth is an increasingly important part of the day to day experience of IT within a school. With many services and software now dependant upon web-hosted technologies, schools should ensure that their available bandwidth increases to match the number of simultaneous devices sitting on their network that require internet access. Many London schools have contracts with LGfL, where their negotiated bandwidth is based on the size of the school. We recommend that all schools look to boost their bandwidth to as close to 100mb+ that they can afford, in order to future proof the school. With most programs moving online and being web based, as well as the increasing use of streaming videos, this speed will allow them to run with no delays in loading pages or buffering issues. Upgrade costs are less than you might think. To put this all into perspective, many schools are only on a 25mb-50mb contract in an environment where 100+ devices are used. In your own home, you are likely to be on the same speed (25mb-50mb) but shared between a handful of devices. To upgrade, get the ball rolling by contacting your ISP for a quotation.

Wireless

All schools are advised to make the most of the advances in mobile wifi technology. Using tablets, laptops and other devices can help schools to get the most benefit from technology wherever they are within the school premises and move learning with technology from the IT suite into the classroom while also enabling teachers to take learning experiences outdoors.

Previously, schools may have installed a handful of SOHO (small office and home) wireless access points. These access points are

designed to be used with a handful of devices in a home environment. They are unable to cope with educational or large enterprise environments where potentially 50+ devices need to connect to a single access point. Managed systems such as *Cisco, Ubiquiti or Meraki* centralise the management of the wireless access points, ensuring there are no frequency/channel overlaps, or transmission conflicts that interfere with efficient network communication, while also balancing the load and demand that school usage would place on wireless infrastructure.

Ensure that the wifi system you have is capable of creating a separate guest wifi network in your school environment (this sometimes requires managed switches to create virtual local networks – VLANs). The ability to offer a guest wifi access to visitors/parents is becoming more common and we anticipate this will be an expected norm soon.

We recommend that schools invest in a support package for their chosen wireless system. Firmware upgrades, security patches and feature additions are often provided as part of a support package and will enable your system to serve the school's needs for years to come.

Systems such as those mentioned above are an absolute must for any school considering deploying tablet devices. Without prior investment in infrastructure, purchasing iPads, for example, could be a wasted expense.

Client environment

Windows 10 is Microsoft's latest and greatest offering in their line of operating systems. With Microsoft's support for Windows 7 due to expire in January 2020, a whole school rollout of Windows 10 makes perfect sense. The operating system is the most secure and stable to date, and we have found that it runs

more efficiently on entry level systems, in comparison to Windows 7. Many issues that were previously experienced when upgrading to previous versions, such as incompatible device drivers or software compatibility bugs, have been eradicated.

Schools should ensure their workstations and laptops use Intel i5 processors with a base of 8GB of RAM. Any spec above this is preferable and will future proof your investment for longer. We believe that SSD storage options and 802.11ac dual band wifi technologies make a huge difference to the all-round user experience and schools should start to invest in these features as a base level for new purchases.

Mobile devices

iPads still dominate the mobile tablet market within education. This is primarily due to the dominance of Apple's App store leading to a strong edtech community centred around iOS applications. However, without knowledge and expertise, iPads can be tricky to administer and integrate in an education environment built upon Microsoft technologies. Schools should plan how they are going to use and manage their devices before buying them. A mobile device management system should be purchased, preferably one that is then linked up to the schools Apple School Manager.

Chromebooks are also now increasingly popular within the education sector. Chromebooks are devices built to run Google's Chromium operating system, which is a lightweight operating system designed to run on affordable devices, with many of Google's apps and services pre installed and integrated. If a school already uses the Google cloud office suite (G Suite), Chromebooks can be centrally managed and administered from your familiar G Suite admin panel.

Audio/visual

Projectors in classrooms will eventually become a thing of the past. Projectors require substantial maintenance, suffer from chronic overheating, degradation of lamps, shadowing and are a health and safety risk (ie children staring into the lamp, bulbs shattering due to overheating), as well as being tricky to install and requiring a substantial amount of cabling. We advise schools to look at alternative methods of interactive display such as 45-86 inch LED displays. These screens provide an “all-in-one” solution (display, interactivity and sound) with an average working life cycle of 20 years, achieved using minimal cabling. The displays are brighter, higher resolution

and do not have to be frequently calibrated or aligned correctly. SMART, Promethean, Vii Networks and CleverTouch are a few examples of companies that provide a product line while often including their own versions of interactive software specifically designed for classroom use.

While these screen displays often provide inbuilt audio outputs, they can sometimes lack the quality and power output required, particularly in larger classrooms. These problems can be addressed by the use of home cinema sound bars which cost as little as £100 and provide a problem-free alternative to amplifiers and wall mounted speakers.

Technical services

Schools need to have a reliable and functioning IT system that meets the day-to-day requirements, vision and ethos of the school. While you may have invested thousands of pounds wisely on an excellent IT infrastructure, you also need good IT support provision to ensure that the system is well-maintained. Good technicians or support services work with a school on a proactive basis identifying potential problems and resolving issues efficiently, while also providing strategic and impartial advice in the school’s best interest.

Some schools may require half a day a week but most will need a day a week. If schools have on-site technicians, more flexible packages of second or third line of support should be considered so that school-based staff can be supported by experts if and when issues can’t be resolved in-house.

IT support providers should be accountable. Ensure that your support requests are all logged as conversations in person or in corridors can lead to confusion or deniability. Support providers should ensure that everything they do is documented and traceable. Be suspicious of any provider that has no interest in demonstrating or adhering to this. In the case of transition from one provider to another ensure that as many details as possible about the configuration and system setup are provided to the new technicians. This is essential as it will cause serious issues if information is not passed on.

Ask for proof of a successful and regular backup strategy. Support providers should all be encouraging schools to have a multi-pronged strategy, using offsite/remote/online backups along with traditional local methods. Ask questions and never assume. Always check that your provider is providing the most cost-effective online backup solutions. A two form entry school should be paying in the region of £30-£40 per month for such a service (Nov 19).

If your provider also takes on your web design and maintenance, ensure that the domain name is registered to the school and not to your support provider. If the domain is registered to the school's provider then you do not own your website name and, should you decide to change technical provider, they are at liberty to take down your site. One local school we work with had to buy their domain from their previous technical provider at two hundred times the actual cost in order to keep their domain and website. To check who owns your domain, use a site such as <https://who.is/>.

As a rough idea of what to expect from a technical support provider, your setup and domain configuration should provide:

- Individual user accounts for every member of staff
- User accounts for every pupil
- User accounts allocated access privileges based on their roles and responsibilities within the school
- Protected "shared" user areas for file storage. Typically: an admin share, a teacher share, a student share etc
- Individual user areas for each individual network account, accessible only to the individual, technical support and designated members of senior staff
- Filtered internet access - often this is provided by LGFL but can be configured and tweaked by nominated members of staff or support provider employees
- Shared printing ability depending on predetermined access rights

Your technicians should also provide:

- Advice regarding onsite and offsite backup for all user generated data - including MIS and financial systems
- Relevant and useful advice and guidance on developing and maintaining your school IT systems

For further information contact techsupport@londonclc.org.uk

“ The CLC's provision of a joined-up technical and curriculum support service has become an integral part of everyday school life at Hillmead. The CLC's technicians have completely transformed the school's infrastructure and we always have confidence that procurement advice is provided not only with independence and value for money in mind, but also primarily how the equipment can aid our delivery of the curriculum. ”

Deputy headteacher, Hillmead Primary School

