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# Getting the best value for your E-rate dollar

**The FCC and Tech Directors across K12 are looking for best value in bandwidth management. Upgrading bandwidth is no longer the best strategy. Schools need to plan for exponential capacity and performance demands in the years to come. This paper provides an overview of the key criteria schools should consider to get the best value for their E-rate dollar. .**

## The Case for Caching in Schools

For over a decade, K12 schools have been upgrading internet links as their only strategy for dealing with an inexorable rise in demand for bandwidth.

In many cases, an annual bandwidth upgrade is 'easy' – the mere flick of a switch. But the FCC – and increasingly schools themselves – are realising that it does not deliver exceptional ROI.

Today, the nature of K12 network traffic has changed fundamentally, making a significant case for a change in strategy. Recent research into web traffic activity in US K12 networks shows:

1. Content and software updates are served by the internet much slower than a typical K12 network will allow – the cause of this slowness being much further upstream of the school's network and beyond the reach of the District's tech team.

   Caching, however, serves content at LAN speeds. St Paul Public Schools, for example, is seeing most classroom content delivered 10-20x faster from cache than its multi-gigabit internet connection can achieve on its own

2. Peak demand in K12 is characterised by numbers of students directed to fetch identical content at the same time. Here, caching delivers considerable financial return via bandwidth savings.

   At the start of each lesson, a single High School at St Paul sees peaks in demand up to 900Mbps – yet only 100-150Mbps of that is fetched from the Internet. The remaining majority of the traffic is served from local caches, slashing bandwidth from the ISP.

Recognising the advantages of caching for schools, the FCC has allocated E-rate funding for caching solutions.

For schools investing in 1:1, more bandwidth alone will not guarantee the speeds needed in the classroom.

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## K12 Caching Requirements & Solution Design

With a limited technology budget allocated each year, schools need to ensure you get the best value caching solution for your school. What does this mean?

In the K12 environment, it is important to differentiate between the various types of caching solutions available: bolt-on, partial cache, enterprise solution, schools focused caches.

First, you need to understand what your school's network characteristics demand from a cache to be an effective solution and provide the best return on investment.

### Large storage

A very wide range of sites are accessed in the classroom (in K12 we see dozens, hundreds of sites in use daily in a single school), and the performance of each one impacts students' learning experience.

In addition, a typical school district today supports multiple different device platforms - Windows, Chromebooks, iPads, laptops and Macs – and all types of mobile devices. These regularly download large software update files to keep them up and running.

The combination of classroom content and software means schools' caches need an appropriate amount of storage to handle this traffic – typically a couple of terabytes for an Elementary School, dozens of terabytes for a large multi-school district with a multi-gigabit internet pipe.

An Enterprise cache – where the caching functionality is a bolt-on to a web filter or firewall – has storage for just a fraction of what is needed in K12.

### Dedicated cache

Peak demand in schools can easily spike to 6 or 7 times the average. This huge increase in workload for a cache is likely to coincide with peaks in demand for other network functions like web filtering, logging, routing and so on.

To handle these peaks, you need to guarantee that the caching function has the resources it needs when it needs them.

For caching to be effective, large numbers of users need to be served simultaneously. This relies on disk, RAM and processor activity.

Multi-function devices carry the risk of the cache becoming the new bottleneck in the network if for example, at the start of a lesson, the on-board web filter is consuming all the resources the cache needs.

A dedicated single function appliance ensures there is no danger of this happening.

## Advanced traffic-handling capabilities

School networks have become increasingly complex in the last decade.  A caching solution now needs specialist capabilities if it is to handle:

- HTTPS

- Content Delivery Networks

- Dynamic content

- Windows, iOS, Chrome OS updates, AV signatures

- YouTube and other video

- Web-based content from the likes of Pearson, Compass Learning, Lexia, Rosetta Stone, Khan Academy, Study Island

- LMS's like Moodle and Blackboard

- Support for online testing

A schools-focused cache doesn't just handle the wide range of websites and devices on a school's network, but also has the specialist features to make critical curriculum content available beforehand, ready to be served as and when required:

- Pre-caching – programmed fetching of content in advance of lessons

- Priority content management – keeping regularly used materials for instant access

## Safeguarding and Control

Tech teams carry their share of the responsibility of keeping young students safe.  That means a cache must have the features to help with control, e-safety, reporting and safeguarding:

- HTTPS interception

- Integration with Microsoft Active Directory

- The ability to keep a permanent record of who visited which domain and when

- Google SafeSearch

- Seamless integration with existing security regimes and content filters

- The ability for teachers to direct students safely to pre-selected content through a teacher-led portal

## Value for Money

The schools sector has its own challenges in terms of procuring, deploying, supporting and managing increasingly complex and numerous technologies and equipment, by an already stretched tech team. Meanwhile, the need for value for money is at a whole different level compared with some corporate situations.

Schools-focused aching solutions must minimise the Total Cost of Ownership.  That means:

- Best value pricing

- Ease of use - plug & play

- Range of models suitable for all school sizes

- Scalability & hierarchies

- Support

  - World class

  - Minimal requirement via ease of use

- Comprehensive reporting

- Central management

- Remote deployment capabilities for remote schools

Above all your caching solution must qualify for E-rate funding – which means being dedicated to the task, and delivering excellent value for money.

E-rate Cat2 eligibility offers a small elementary school to pay as little as a few hundred dollars for an appropriate dedicated schools caching appliance. Meanwhile for a large district, where funding might be worth hundreds of thousands of dollars, caching eligibility could save several times more than that in reduced bandwidth costs.

ApplianSys has consulted with schools across 40 states to evaluate the particular dynamics of the K12 environment and the characteristics of schools internet traffic.  The findings are presented in a webinar that you can sign up for here.

## Why hundreds of Schools choose **CACHE**BOX

With a pedigree in the schools market of over 15 years, hundreds of schools in the US choose **CACHE**BOX because it can handle modern internet traffic better than any other cache:

- Schools-focused caching appliance
- Specific features designed to handle school traffic like Edu content, software updates and video
- Easy to use, intuitive interface makes configuration easy
- Detailed reporting for bandwidth management and control
- HTTPS caching
- Outstanding value

**CACHE**BOX is E-rate's most popular caching appliance, delivering huge speed increases and significant bandwidth across the US.

**Find out how CACHEBOX can help your school by emailing sales@appliansys.com.**