Why are US schools deploying web caches?

In order to get better value out of existing and future bandwidth provision, and to improve internet performance in the classroom, the Federal Communications Commission (FCC) decided to fund caching technologies under E-Rate Category 2.

CACHEBOX **is the most widely used caching appliance in US K-12. 40% of schools applying for funding in 2015-16 specified CACHE**BOX**.**

For schools like Saint Paul Public Schools in Minnesota who have deployed **CACHE**BOX in high schools, the results have been a revelation.

'LAN speed' peak delivery

- At peak times, a **CACHE**BOX at each school in the district now serves up to 800 Mbps of requests from internet links with no more than 100 Mbps capacity.

Classroom browser speeds accelerated

- Web content is served 10-15 times faster from cache than from the internet.
- Some education sites are up to 200x faster.

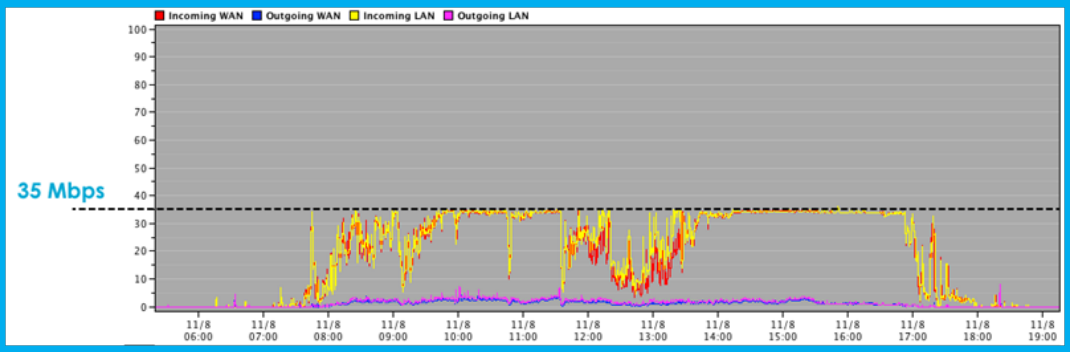
Taking traffic off the WAN for big bandwidth savings

- By storing and serving content locally, each school reduced link utilisation by 50-60%.
- Bandwidth hogs like Apple, Windows and Chrome updates no longer cause congestion.

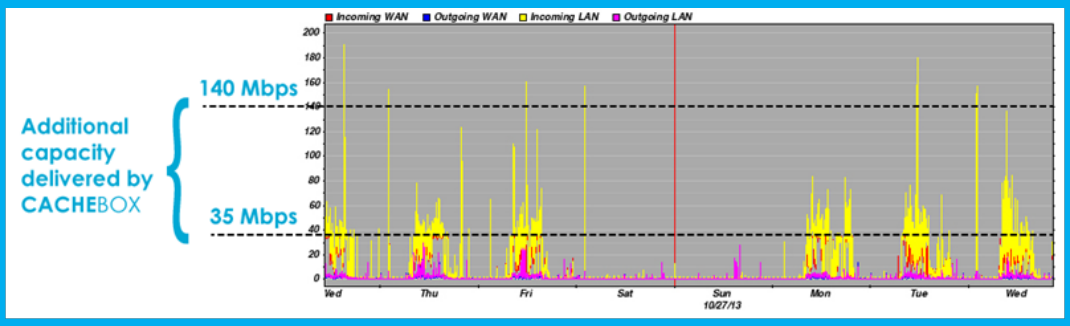
1. Handling the peaks, eliminating congestion

Sioux Central CSD was suffering painfully slow web-browsing: when students tried to download the same video at the start of a lesson, they were waiting for several minutes before being able to watch just a single minute.

Before CACHEBOX - its 35 Mbps internet connection was saturated.



After CACHEBOX - demand could be seen peaking at over 140Mbps at the start of each lesson. On occasion it would rise to nearly 200Mbps. **CACHE**BOX provided the extra capacity at the times it was most needed.



2. Overcoming latency on slow links

Miami-Dade CPS needed to speed up access to an educational content application that was particularly slow at outlying schools on small connections. An individual page - comprising 30 different objects - would take as much as 30 seconds to load. With **CACHE**BOX, 97% of the content is served from cache, with most of the page loading instantly.

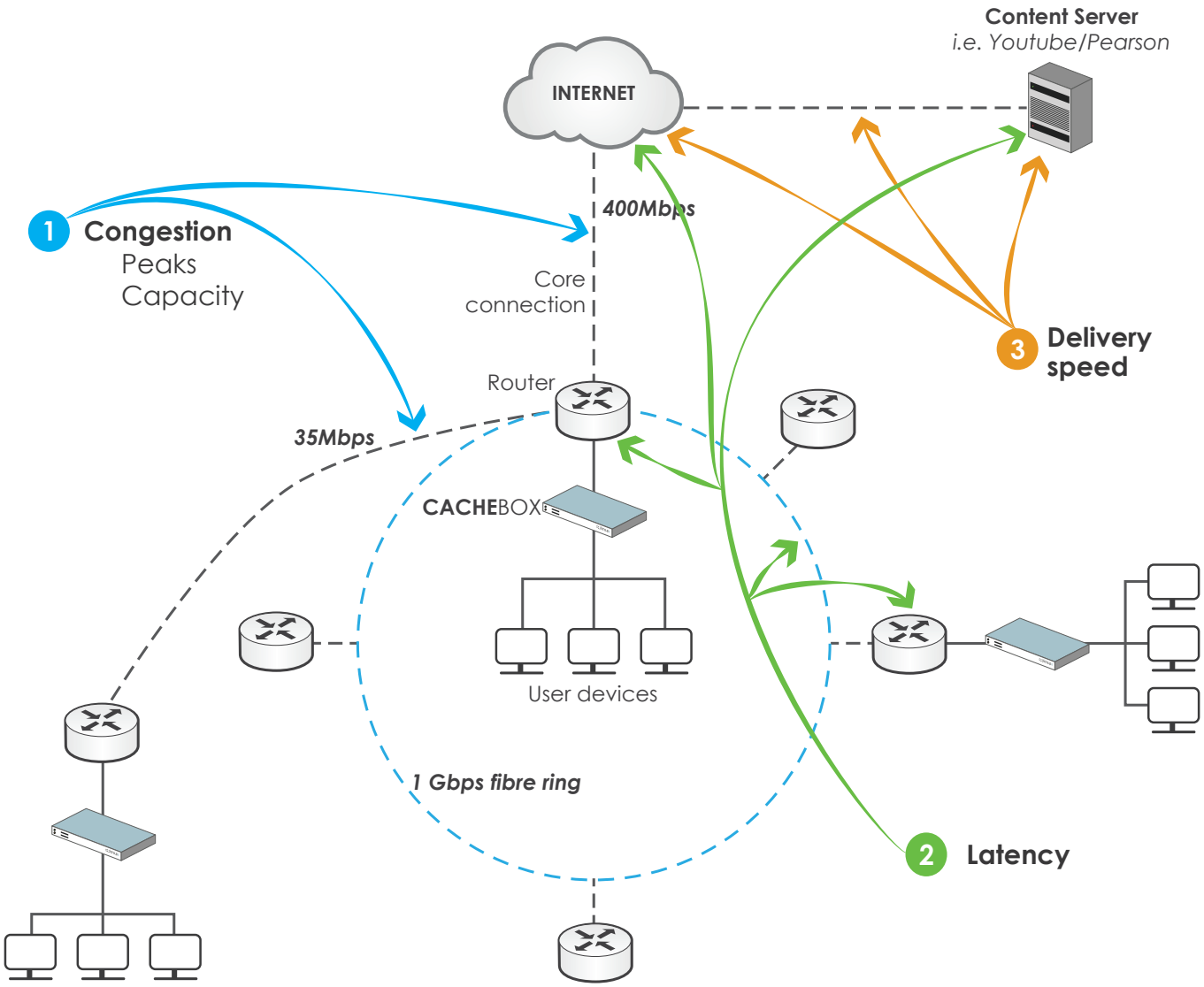
Learning platform **without caching:** 30 requests * 1 second for each = **30 seconds load time**.

Learning platform **with CACHE**BOX: 29 requests at 0.050 seconds each + 1 uncacheable file at 1 second = **2.45 seconds load time.**

In Chicago, Township HSD 214 already had **CACHE**BOX deployed at its network core, saving a large proportion of bandwidth for the whole district. But schools further round its 1Gbps fiber ring were only seeing a part of the benefit in terms of increased browser speeds.

The district deployed a **CACHE**BOX at one of these schools to test the impact of internal network latency at these large remote sites. The results were startling:

- Dramatic improvement in content delivery speeds.
- Removal of internet traffic from the ring – freeing up capacity for other schools.
- Fairer playing field - no student in the district disadvantaged by location.



3. Sparkling browser speeds – even with slow content

By storing and serving content from within the LAN, **CACHE**BOX delivers content an order of magnitude faster – even on multi-Gigabit links.

Laurens County School District, South Carolina has more than a **10 times average speed increase**:

VOLUME of DATA			
Status	Transfer	% of total	KB/sec
TCP_HIT	302,752.11MB	25.0%	944.40
TCP_MISS	554,805.73MB	45.8%	86.72

Some previously slow **educational content is served hundreds of times faster**, giving teachers the confidence to include it in lesson plans:

	VOLUME of DATA		
Host/target	% cached	KB/sec	
*.jquery.com	100.0%	7,170.92	
*.readingeggspress.com	0.0%	5.89	0.047 Mbps from internet
*.apple.com	100.0%	1,402.47	
*.readingeggsassets.com	99.2%	4,847.73	38.8 Mbps from cache
*.schoolblocks.com	97.8%	8,402.47	
edutechupdates.com	0.0%	59.86	
*.googlesyndication.com	2.3%	295.77	
*.wikispaces.com	100.0%	9,097.01	

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