



CACHEBOX supports BYOD for North American School District

CHALLENGE

Educational content in the classroom is becoming increasingly bandwidth intensive

Students were encouraged to bring their own devices to school, putting additional strain on bandwidth

A future-proof caching solution was needed to cater for network development

SOLUTION

2x **CACHEBOX230s** deployed to handle 3000+ devices owned by the district and make most of existing bandwidth

CACHEBOX230 deployed transparently to handle students' devices, without the need to reconfigure them

BENEFIT

Much faster browsing experience for users

Average speed increase of 64% and average bandwidth savings between 30-35% for units handling district devices

Flexible solution caters to both current and future growth of the school's network.

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In today's classroom, online educational material is used to deliver complex information quickly and effectively, but the content – particularly graphics and video – demands ever increasing bandwidth.

For Lindbergh Schools District, a BYOD scheme and the move towards a 1:1 pupil to computer ratio raised the challenge of how to effectively cater to a growing number of devices on its network.

About Lindbergh Schools District

Lindbergh Schools serves more than 5,600 students at one high school, two middle schools, five elementary schools and an early childhood education centre in St Louis, Missouri. Lindbergh is the #1 ranked K-12 schools district in Missouri for academic achievement.

Lindbergh Schools District is served by two separate internet service provider connections. 5 elementary schools are connected to one provider, whilst 2 middle schools and a high school are connected to another. A student network, which lies on a separate domain, caters specifically for external devices connecting to the district's network. All devices connect through wifi.

The Internet-based learning challenge

Lindbergh Schools District wanted to roll out internet-based learning, for which students would be encouraged to bring their own devices to school. However, increasing the number of devices on the network meant putting pressure on existing bandwidth to support the increase in video and graphic files.

Director of Technology Mariano Marin-Gomez explains: “We had a 40Mbps connection to the internet with each school connected to another on a 100Mbps link. Even with four caching servers in place, we were quickly approaching our bandwidth limits.

“In 2010 we introduced a 1:1 student-laptop initiative which added around 2000 laptops to our network. The legacy caching servers we had in place stopped providing critical software updates. With our future scheme allowing students to bring their own devices to school, we were worried about how to cope with the pressure on bandwidth,” says Mariano.

Buying additional bandwidth was very expensive, so Lindbergh decided to upgrade its caching and turned to **CACHEBOX** to make the most of its existing bandwidth.



*There's a lot of YouTube traffic, especially on the student network – this is handled very well by **CACHEBOX**. We had around 30% bandwidth saving from YouTube caching last year.*



CACHEBOX230 units catering to all network domains

Lindbergh Schools District deployed a **CACHEBOX230** in front of each service provider links. These two units are configured as siblings, catering to over 3,000 devices owned by the district.

"One cache handles traffic for the middle schools and the high school, and the other handles the elementary schools," explains Mariano.

Having the two **CACHEBOXes** talk to one another means that a request to one of the siblings can be shared with the other. If either **CACHEBOX** has an object stored, the response time when it's requested is a lot faster because it isn't fetched from the internet.

A third **CACHEBOX230** is deployed in front of the student network in gateway mode. RADIUS authentication is used to grant access to the VLAN, with **CACHEBOX** acting as the gateway.

Mariano comments: "The **CACHEBOX** here is responsible for handling all external student devices that are added to the network as part of the laptop friendly initiative. The unit is deployed in transparent proxy mode so students don't need to change any settings on their devices in order to connect to our network."

Improving user experience and catering for future growth

Since deployment, the district has seen significant bandwidth savings and user browsing experience has dramatically improved.

Mariano comments: "We're very pleased with the performance of our **CACHEBOX** units. Our BYOD scheme is undergoing rapid development and we expect the number of student-owned devices to go up by around 1000. A large proportion of these will be Apple iOS6 devices."

Despite this growth, Lindbergh Schools District has seen an average speed increase of around 64% and 30 – 35% bandwidth savings on average with its **CACHEBOXes**.

"There's a lot of YouTube traffic, especially on the student network – this is handled very well by **CACHEBOX**. We had around 30% bandwidth saving from YouTube caching last year. We also saw significant bandwidth savings from software updates (83% for Adobe and 86% for Apple). User complaints about slow browsing speeds have significantly reduced since we deployed the units," he continues.

Flexible CACHEBOX deployment options compliment Lindbergh's network changes

Since deployment, Lindbergh Schools District has decided to aggregate the two links catering to all district-owned devices. **CACHEBOX** can be deployed to suit a number of network environments. In this scenario, Lindbergh will switch from explicit mode to clustering the two **CACHEBOX230s** via WCCP. This will deliver redundancy and ensure that an increase in traffic will not introduce latency or affect user browsing speeds, because the load is balanced between the two clustered units.