

# Wi-Fi for Education



Beijing BISS International School

## Beijing BISS International School Delivers Superior e-learning Experience with Ruckus Smart Wi-Fi

Beijing BISS International School, as a leading independent schools in China, provides English language teaching from kindergarten, primary to secondary levels at a purpose-built 110,000 square foot facility in the Chaoyang District of the capital. It was founded in 1994 by a group of Singapore educators and now serves more than 320 students of 42 nationalities – mostly children of business executives and diplomats working in the city.

Along with other leading international schools using the International Baccalaureate (IB) curriculum, courses heavily count on information technologies to encourage collaborative and enquiry-based learning, which includes one-to-one learning through the school's Study-Wiz and Wikispaces systems. Students use laptops and tablet devices to access to the school's Wi-Fi network for searching e-books, coursework collaborations, submitting homework and uploading multimedia projects.



One-to-one learning programme at BISS offers an environment where students and teachers have 24-hour-a-day, 7-day-a-week access to a laptop computer as well as digital content, educational software, and digital authoring tools.

### High Demands on Aging Network

The school's first Wi-Fi network was installed five years ago based on technology available at that time. It was built in a piece-meal fashion using first generation products more suited to home environments and low user density. With the network becoming more loaded with device, performance was becoming an issue with frequent drops of connections, especially in certain high user-density areas.

"Students' laptops were frequently disconnected when they were moving from one classroom to another," said Louis Lim, IT manager of BISS International School. "Limited capacity was another problem - some of the old access points only allowed up to 20 connections at the same time,"

BISS campus is situated in residential area with countless home Wi-Fi networks and telecom service providers' Wi-Fi hotspot access points with high-gain antenna. These neighbourhood Wi-Fi network created a very noisy environment, which made school clients much harder to have a "clear" conversation with the school's access points. The consequences was much lower throughput or drops of connections.

### Trial and Upgrade Programme

"We invited three vendors to set up their equipment in the classroom, and asked 35 pupils to connect to it to access the Internet, run streaming video, or anything that they used to do during the class. Feedbacks from the pupils concluded that Ruckus gave them the best surfing experience." Louis Lim said.

"Compared with the other two vendors, Ruckus required the least number of access points and the overall equipment cost was 10-20% lower than the other two vendors." Lim added. Therefore BISS International School decided to go with Ruckus.

### COMPANY OVERVIEW

Beijing BISS International School, located in Chaoyang District of the capital was established in 1994, is an independent full-time school, providing kindergarten to secondary level teaching in English. Beijing BISS International School occupies an area around 110,000 square feet including the main teaching building, language centre, kindergarten and basketball courts. It currently teaches more than 330 students from 40 countries all around the world.

### REQUIREMENTS

- Deploy central managed WLAN in campus
- Full indoor Wi-Fi coverage
- High density and stable connections
- Easy-to-manage security
- Robust interference avoidance
- Support voice and video applications
- Guest network

### SOLUTION

- ZoneDirector 1000 Smart WLAN Controller
- 25 ZoneFlex 7942 802.11n Smart Wi-Fi access points
- 10 ZoneFlex 7962 dual-band 802.11n Smart Wi-Fi access points

### BENEFITS

- Fewer APs and lower price
- Supports massive streaming of voice, video and data traffic
- Differentiated user access
- Simple guest access management
- Reliable Wi-Fi connection
- Automatic interference avoidance
- Smart antenna technology eliminates deadspots





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The school's Wi-Fi upgrade project was initiated in the summer vacation in 2009. In the first phase of the project, all of the old access points were replaced with Ruckus ZoneFlex 7942 single-band units based on the 802.11n standard. The initial focus was the first and second floors of the main teaching building. After fully evaluating the performance for a year, BISS International School decided to further extend the Ruckus Wi-Fi network to other areas of the school in the second phase. The second phase implementation began in the summer of 2010. The school added thirty-five ZoneFlex 7962 802.11n dual-band access points to the network. All access points are managed by a single ZoneDirector 1000 Smart WLAN controller.

BISS International School did not need to install access points inside each classroom. "Each access point can support two to three classrooms," said Lim "Only 35 ZoneFlex smart Wi-Fi access points give us high-density coverage and reliable throughput. Ruckus access points can be installed over existing ceilings, allowing existing classroom decor to be maintained," he said.

### Stable Signal and Interference Mitigation

Interference from surrounding Wi-Fi networks had impacted the performance of the school's Wi-Fi. Therefore, BISS International School needed something more sophisticated.

Ruckus' ZoneFlex 7962 and ZoneFlex 7942 access points utilise Ruckus' patented adaptive antenna technology. With their internal smart antenna array, they can automatically adapt to the RF environment by steering Wi-Fi signals around obstacles and interference sources, ensuring predictable performance for multimedia traffic applications.

### Simplified Management and Improved Security

Unlike many schools in China, BISS International School is open to visitors, touring academics, conferences, and other after-hours activities, during which mobile devices often require data access. Differentiated network services play an important role in such environments. Separating guest network access from core campus services not only helps the school plan and manage Wi-Fi performance, it also guarantees the security of campus WLAN.

Multiple Service Set Identifiers (SSIDs) can be configured within each Ruckus ZoneFlex access point, each with unique broadcast, Quality-of-Service, security and management parameters

assigned. This enables BISS International School to easily offer tiered services to different users or traffic types. The school can use these features to differentiate guest and faculty access policies or to segment different traffic types.

The ZoneDirector 1000 provides innovative new techniques that simplify and automate Wi-Fi security. In addition to enterprise-class 802.1x support and dynamic Virtual LAN (VLAN) assignment capabilities, the ZoneDirector 1000 supports a patent-pending Dynamic Pre-Shared Key (PSK) capability that streamlines WLAN security configurations.

First-time guests log their computers into the LAN and specify a URL that directs them to a captive web portal for a one-time authentication. This then automatically configures the client system with the designated SSID and a dynamically-generated encryption key. The key is bound to the client, and can be removed upon expiration when the user or the user's device is no longer trusted.

The Ruckus ZoneDirector centralises authentication and authorisation decisions for all access points, providing secure admission control across the WLAN. In addition, ZoneDirector 1000 provides a detail map view that lets administrators quickly see the Wi-Fi network topology for all ZoneFlex Smart Wi-Fi access points.

"High-performance Wi-Fi access points provide a guaranteed service for the teaching activities for students and teachers. The ability to simply manage the school WLAN and deliver secure network dramatically reduces the burden on the IT department," said Lim. "I don't need to worry about patchy Wi-Fi performance, potential security threats caused by guests, or demands on bandwidth that may affect normal teaching content anymore. I can focus more on other issues."

### A Showcase for Advanced Learning

With BISS International School's network complete, day-to-day activities run smoothly and the campus is more than happy to accommodate visiting academics and conferences with its state-of-the-art facilities.

"New technologies greatly facilitate better teaching. I believe that advanced learning programmes and the mobile internet can help improve existing teaching models and the learning experience," he said.

