Clarity project to meet hi-tech challenges:
Video in Road to IELTS

Overview: Road to IELTS is an online and network-based preparation resource for the IELTS test. Clarity worked with the British Council to produce the first version in 2006. In 2011, specifications were drawn up for V2. This new version has a new section which includes 17 videos from British Council IELTS experts. This document focuses on the challenges of delivering the video.

Challenges... and solutions

The overall challenge was to deliver video reliably and smoothly to hundreds of thousands of users across the entire world, encompassing a variety of devices and bandwidths. Delivery of the British Council Last Minute version of Road to IELTS is 100% online, so Clarity was not able to default to a CD-Rom solution for countries with low bandwidth.

Building the video player

The initial approach was to use an existing video player made available by one of the providers of video streaming services. However, this was found to be unsatisfactory. Road to IELTS as an application requires very specific behaviour. For example, if a user is watching a video in the Speaking section and clicks to move to the Reading section, the video needs to stop; but if the user clicks to open a PDF, the video should continue. Existing commercial players did not offer this level of control. Additionally, while Clarity was experimenting with the Vimeo player, they changed their API from one day to the next without informing users. This meant that until the API was updated, nothing worked at all.

The solution was for the Clarity team to build its own video player, using some commercially available components. This was probably the biggest task of the whole project.

Finding the optimum provider for streaming

The Clarity team soon realised that there is no global optimum provider. YouTube might seem an obvious choice, but apart from privacy and advertising issues, it is not available in several countries, including China. Vimeo works reasonably well almost everywhere, but in some places, such as Hong Kong and Singapore, Amazon (AWS) has a higher performance and more features. However, AWS performs badly in other countries, such as Bangladesh.

The solution was to use three providers, with Vimeo as a default and two other channels (AWS and Akamai) which users can switch to, initially manually.

ClarityEnglish

Optimising delivery

Studies of user behaviour revealed that most users will not use the alternative channels to optimise their viewing experience, but will simply stick with the default. The next stage was to enable the system to select the best available channel automatically, while retaining the manual control option. A system was therefore set up to: (a) define country, (b) measure bandwidth, (c) detect whether an alternative channel was chosen and (d) measure the smoothness of video delivery. The resulting data results initially in a very simple formula for channel selection: India + high bandwidth = Player X at high resolution; India + low bandwidth = Player Y at low resolution. Once this is in place, continued data collection and analysis allows the system to be progressively refined.

Handling a variety of video formats

Using a variety of video streaming providers means delivering video in several different formats. Vimeo delivers low resolution, high resolution and iOS videos from a single format, but AWS and Akamai are more demanding. It is time-consuming but not technically challenging to render and make available different formats (currently six). The key is to ensure that the workflow is clear and that all formats derive from the same master file.

Delivering video to China

Delivery to China presented additional challenges. The video is subtitled, so an entirely different set of files was required. Locally-based streaming was required because of the risks of blocks from the firewall, but Clarity was unable to identify a high-quality, reliable streaming service in China. The short-term solution was to choose Vimeo as the default provider, with locally-based streaming from Clarity's own servers. A more reliable longer-term solution is to identify a good local provider.

Lessons learned

1. Video delivery is complicated. Plenty of time must be allocated to getting it right during the product development phase, and as an ongoing task as technology is rapidly changing.

2. You have to have video solutions that work at low bandwidth. It may not always look great, but a steadily running, low quality video will be watched much more than a high resolution one that keeps buffering.