



Streaming Video in Education

Introduction

Everyone who has accessed services such as YouTube and Vimeo has experienced video streaming technology. When clips are accessed via these systems, packets of data are sent to clients' computers and are displayed. The main considerations when viewing media are the users' broadband connection speeds. When media is delivered over the web this is delivered in one of two methods either progressive download which is used by sites for video on demand media or streaming which is used for delivering live media.

When streaming video/audio in an educational environment, the following should be taken into consideration:-

Is the content streamed or simply accessed via a shared folder? (Progressive download).

- If the server is located within the school, the correct way of delivering the media would be to stream the content as the network overheads are a known quantity. e.g. a video encoded at 1mb/s of any duration would equal 1mb/s of network overhead so 10 concurrent users would be equal to 10mb/s of overall network bandwidth. If the content is delivered via progressive download, the size of the video clip determines the bandwidth usage. e.g. A 500MB video clip accessed by the same 10 users would be equal to 5 GB's of network overhead. Planet eStream will deliver content via either of the above two methods however we recommend using streaming internally and progressive externally.

Control of assets - Local installation Vs the Cloud/Data Centre

- With video archiving solutions used within a school environment, a local server install tends to fit better than using an external hosted service for the following reasons:

Action	Cloud/Hosted Solution	Internal Solution
Accessing material within the organisation	Heavy bandwidth usage on external internet connection - every time an internal user views a clip this impacts the external internet connection. As this would be during a school day, other resources are also likely to be using the same external connection, thus causing a potential conflict.	Low internal network overhead and zero external internet connection bandwidth usage.
Ownership of content	Very reliant on the hosting company. If using a hosted platform it is a good idea to check the Terms & Conditions, as a large percentage take ownership of any content you upload to their server.	The establishment has full ownership of their content.
External access	Good external access for students accessing content from home.	Impact on schools external bandwidth however most students will be accessing out of school hours.

Data rates

Table with average data rates

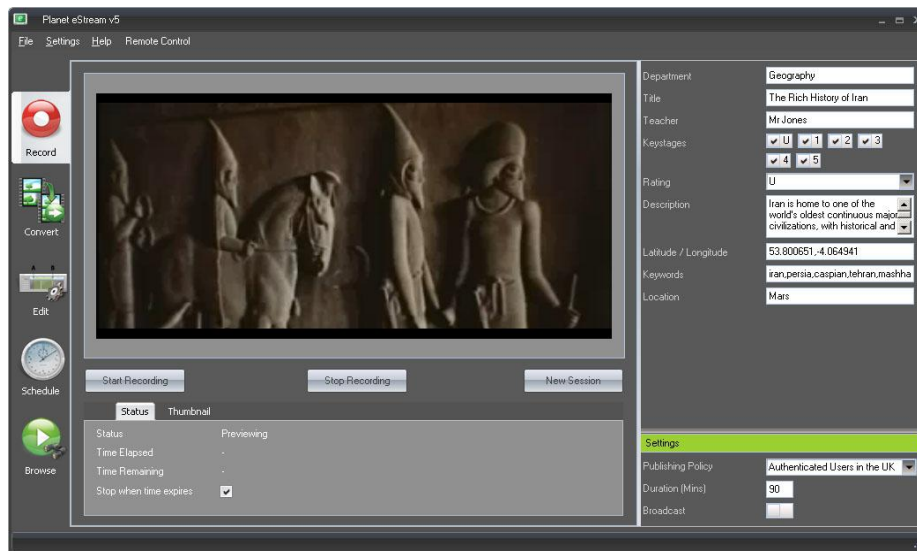
Standard definition VHS type quality	Between 400kb/s & 600kb/s
Standard definition DVD type quality	Between 1mb/s & 2mb/s
High definition 720p (1280x720)	Between 3.5mb/s & 6mb/s
High definition 1080p (1920x1080)	Between 6mb/s & 10mb/s

For most instances 800kb/s is adequate and represents a balance between quality and bandwidth. 1TB of video encoded at 800kb/s would be equal to approximately 2500 hours.

Easy Ingest Tools

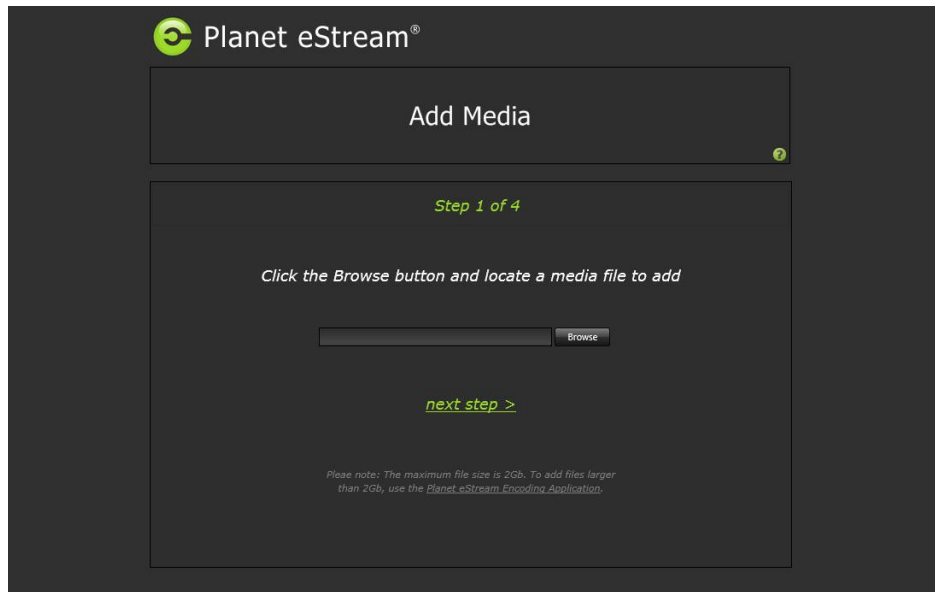
This is a key component to any successful digital media delivery system. If adding media to the system is technically awkward then the system will often become unused. Planet Stream offers very simple acquisition tools to encourage the establishment to populate the system such as:

Live acquisition and streaming via a very simple interface (see image below):



Web Upload

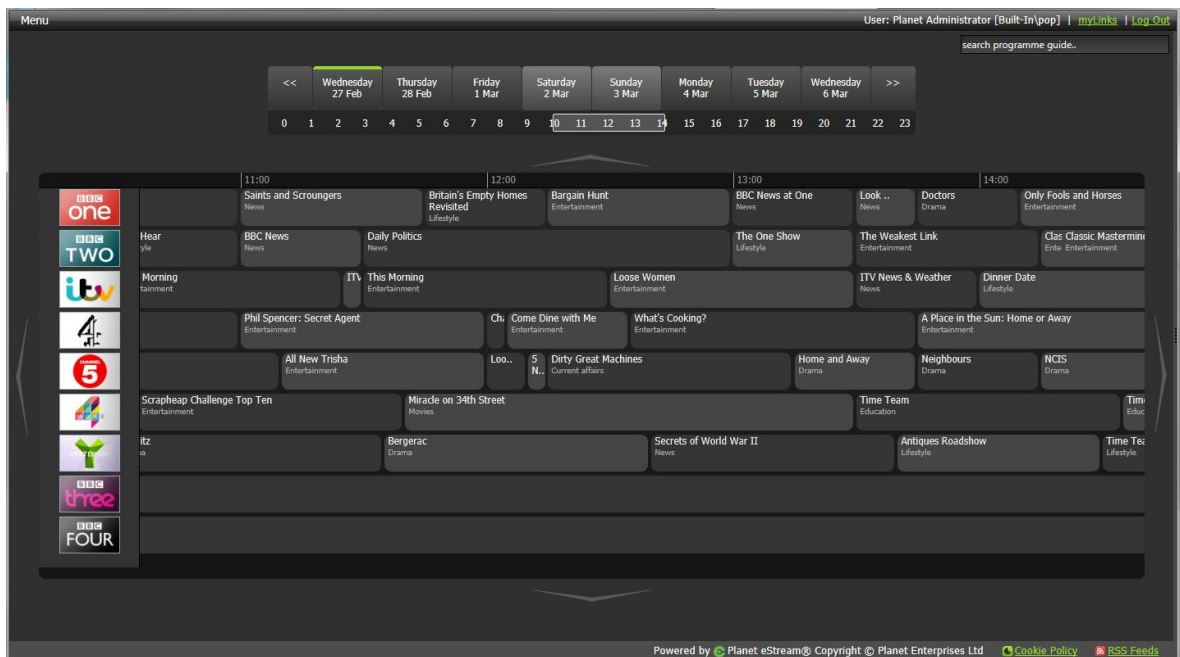
Any authorised user is able to upload video/audio media via the simple web upload tool:



Off Air Recording

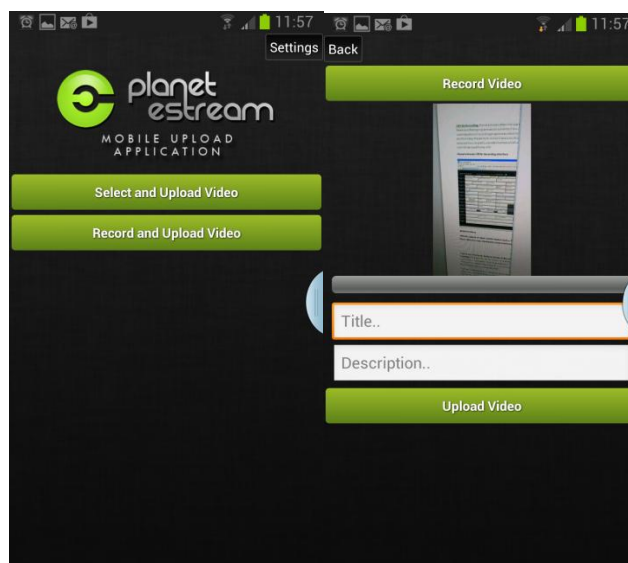
Planet eStream offers the user the ability to record any number of Free to air Television/Radio programmes concurrently. It also offers retrospective recording which gives the user the option of recording programmes which have previously aired. The system also facilitates the ability to multicast stream any number of live TV channels. All this is accessed via a simple-to-use web interface which users of systems like Sky + will instinctively at home with.

Planet eStream Off Air Recording Interface



Mobile Acquisition

Modern Mobile devices running Apple iOS and Android often come with in-built cameras allowing users to record video. Planet eStream caters for this by providing the free to download Mobile Upload Application. This application allows authorised users to upload content instantly to the Planet eStream server.



Delivery of Content

Planet eStream makes delivery of content very simple and includes functionality such as:-

- **Chapter markers** - Educational users traditionally have archives of recordings that have a duration of between 10mins and 2hours. The chapter functionality allows the user to add a marker at a particular scene making it instantly accessible or embeddable into another learning resource such as a VLE.
- **Playlists** – Users are able to create playlists using any of the video media stored within the Planet eStream system either out of full recordings or chapter points within the recordings. These are particularly useful when demonstrating different techniques and are used widely by sports colleges who create playlists out of ball in play time etc. These are particularly useful for demonstrating different techniques, for example staff at a sports college could create a playlist of students javelin throws.
- **Wide Delivery** - All content stored within the system is compatible with PC/MAC/Android & Apple iOS.
- **Digital Signage** – Educational establishments have embraced digital signage technology, enabling the establishments to broadcast information to large screen displays across the campus including rich media such as Video/RSS feeds/weather/timetables etc. Planet eStream includes a full multi-zone digital signage component including free unlimited clients making the system very cost effective.
- **Integration** Planet eStream also provides tools and plug-ins for VLE/library systems such as Moodle/Blackboard/Sirsi Dynix etc.

Administration

Planet eStream Integrates with Active Directory/LDAP enabling granular control of assets and functionality within the system. The system also provides customisable meta data input fields including text entry boxes/drop down lists/radio buttons and check boxes. With the ability to create publishing policies the establishment has full control over where media assets may be viewed and who can view them.

Stats – Planet eStream creates comprehensive statistics on users and media usage.

Modern Teaching Practice example supported perfectly by Planet eStream

A great use of video on-demand systems is the relatively new teaching method known as Flip teaching (or flipped classroom). This is a form of blended learning which encompasses any use of technology to leverage the learning in a classroom. It enables a teacher to spend more time interacting with students instead of lecturing. This is most commonly being achieved using teacher-created videos that students can view outside of class time.

The traditional pattern of teaching has been to instruct and tutor on a subject during lesson time and then assign students to read a section of a textbook in their own time which would then be discussed the next day in class. Students would then be given an assessment for their homework to demonstrate their mastery of the topic. With flip teaching, the student first studies the topic alone, typically using video lessons created by the instructor or shared by another educator. In the classroom, the pupil then tries to apply the knowledge by solving problems and doing practical work. The role of the classroom teacher is then to support the student when they become stuck, rather than to impart the initial lesson. This allows time during the lesson for additional learning-based activities, including use of differentiated instruction and project-based learning.

Flip teaching allows more hands-on time with the instructor guiding the students, allowing them to assist the students when they are assimilating information and creating new ideas.

Uses of Planet eStream in Education

Archiving

As Planet eStream offers a comprehensive video archiving facility with multiple methods of ingesting media into the system. The user is able to digitise all existing physical media e.g. VHS/DVD and archive this to the system this of course eliminates the requirement for DVD/VHS players in the classroom. The System will also batch convert existing file based media e.g. MPEG/DIVX/.AVI/QuickTime. The user now has a central media archive containing their existing media collection which is accessible from any location via any device. The user is able to create custom Meta data input fields including drop downs, text boxes, radio buttons and check boxes.

Provide a 24/7 Knowledge base supporting;

- Examination revision
- Continuing professional development for teaching staff and other personnel
- Students with accessibility issues
- Absent students
- Distance learning
- Remote access to digital media for lesson preparation

Live Streaming

Live streaming is a powerful method of delivering live footage to remote users. Education users find many different applications for this such as:-

- Live Theatrical performances
- Guest speakers
- Head teacher Announcements
- School news reports
- Lesson/lecture capture

- Announcements
- Sporting events
- Assemblies
- Lesson observation
- Prize ceremonies/graduations

Live sessions can be delivered via multiple methods within Planet eStream, such as embedded into VLE/Websites and via Planet eStream's powerful digital signage system.

Mobile Acquisition

Planet eStream also features an iOS (Apple) & Android app which allow the user to shoot or select a video with the phone/tablet and upload this directly to the stream server. This is widely used by teachers who can simply pick up a tablet device and shoot a practical demonstration which will be available on the eStream system for the students to view after the lesson.

Andrew Milburn – Planet Enterprises Ltd 27th February 2013