

# An Introduction to Video Conferencing for Kent Schools

## ***What do you want to use Video Conferencing for?***

The advantages of using video conferencing can be many and varied depending upon how it is used. Some of the more obvious educational benefits are:

- saved travelling costs, both in time and money
- collaborative working opportunities between schools
- improved access to specialist knowledge
- Challenging communication opportunities for students

The primary consideration when looking at video conferencing, is deciding what it is that you are trying to achieve. What do you want to use video conferencing for? Making this decision will influence the equipment that is most suitable for your needs. Listed here are some of the more common video conferencing scenarios;

- **One to one sessions**, where a single person in one school needs to talk to one other person at one or more other locations, maybe a meeting of head teachers for example.
- **Small groups of people**, where maybe half a dozen people need to communicate with one or more locations, each with a similar number of participants. This could be sixth form groups communicating across schools or other small groups of students collaborating on a project between schools.
- **Delivering Lessons/Presentations centrally**, where a specialist subject needs to be taught by a teacher from another school or even by a subject expert from industry or another external organization.
- **Dispersed lessons**, where whole classes of students interactively participate in lessons between schools

The quality of video conferencing is affected by the quality of your codec, camera type, microphone and speaker type, the room environment and network bandwidth if using IP rather than ISDN.

## ***What Equipment Do You Need?***

If you are only intending to use video conferencing for one to one situations, then you can comfortably manage using a suitably equipped PC. You would need a webcam and a microphone / speaker combination, preferably a headset, to reduce the amount of background noise entering the conference. In addition to this you will need a software codec. To equip an existing PC could cost less than £200.

For anything more than a small group of people, a typical webcam is really insufficient for good quality fully interactive video conferencing. The resolution is too low to be viewable on anything other than a small window on a PC screen. Software codec options are currently really limited to the following products; Tandberg's Movi client and Polycom's PVX client software.

For good quality video conferencing you will need to look at a dedicated and integrated camera and codec system. The main manufacturers in this arena are Tandberg, Polycom and Sony. These systems will support video conferencing which can be displayed full screen on a television or through a projector. The cost of this approach is significantly greater than the webcam approach, but provides

much better quality and flexibility in the scenarios in which it can be used. The cost of one of these systems is typically between £3,000 and £7,000. This doesn't include the cost of a television or projector! The systems need to support IP network communication rather than ISDN communication to be used over the KPSN network. The technical protocol which needs to be supported is called H.323.

Additional optional items which improve the quality of the video conference are external headset and/or handheld microphones for the main presenters. Additional cameras and monitors can also enhance video conferencing with large groups of people.

### ***Factors to be considered***

- Does your equipment need to be portable or are you going to setup a dedicated VC room?
- Is your chosen room suitable for VC e.g.; blinds or curtains at the windows, good internal lighting, fairly plain walls at the front of the room, not subject to a lot of external noise?
- Which VC scenarios do you want to be able to accommodate, from individual upto whole class use?

### ***EIS Centrally Installed Video Conference Infrastructure***

#### **Gatekeeper**

The gatekeeper is the device which all the endpoints in the schools register to. The gatekeeper is responsible for call setup and call routing. It maintains the relationship between IP addresses of devices and the E.164 numbering scheme which is used by the endpoints. The gatekeeper enables calls between schools within Kent

#### **Firewall Traversal**

EIS have installed a firewall traversal solution which interacts with the gatekeeper. The firewall traversal solution allows video conference calls to be made into and out of Kent. One of the main functions of this solution is to allow calls to be made with the JANET Video Conferencing Service (JVCS)

## **JANET Connectivity**

The EIS video conferencing equipment has been neighbored with the Janet Video Conferencing Service (JVCS). This provides the ability for all KPSN users to make IP based video calls to all suitably equipped RBC connected schools, HE/FE establishments and the UK Universities. It also provides the ability to make global calls via the JVCS service.

JVCS also provide some other key services which KPSN schools can make use of:

### **Multipoint Conference Unit (MCU)**

This gives schools the ability to video conference between more than two schools or organisations at the same time. Conferences can easily be held involving half a dozen schools or locations together in the same call.

### **ISDN Gateway**

The ISDN gateway gives the ability for KPSN IP based users to video conference with ISDN based users. This saves the cost of having to rent an ISDN line in each school. ISDN call charges for outgoing calls are charged back to the individual school requesting the conference.

### **Conference Recording**

JVCS also operate a service where you can record conferences and then download them for future use and reference.

## ***Common Technical Terms***

<b>ENDPOINT</b>	Any video conference enabled device
<b>CODEC</b>	Compresses the audio and video signals to transmit across the network. Often integrated with a camera in higher end systems or a software application for desktop use.
<b>E.164 NUMBER</b>	A unique number (much like a postcode) allocated to each endpoint and used primarily by gatekeepers. It can also be dialled directly by other endpoints.
<b>MCU</b>	Multipoint Conference Unit – Allows multiple participants rather than just point-to-point conferences.
<b>GATEWAY</b>	Provides connectivity between IP and ISDN networks
<b>GATEKEEPER</b>	Registers endpoints and provides address resolution between ISDN and IP addresses, and between E.164 numbers and IP addresses.
<b>IP</b>	Internet Protocol – The most common Local Area Network (LAN) traffic type used to send information across computer networks. Video conferencing systems using IP need to conform to the H.323 protocol as a minimum standard.
<b>ISDN</b>	Integrated Services Digital Network – A set of standards for transmitting digital information over ordinary telephone copper wire. Video Conferencing systems using ISDN need to conform to the H.320 protocol as a minimum standard.
<b>H.323</b>	The umbrella protocol to define video conferencing over an IP network
<b>H.320</b>	The umbrella protocol to define video conferencing over an ISDN network

## **More Information**

For more information about video conferencing in Kent, please contact the EIS Schools Broadband Service Desk: email: [eis.support@kent.gov.uk](mailto:eis.support@kent.gov.uk) or telephone 01622 206040

There is also a Kent Learning Zone collaboration site dedicated to video conferencing which has a lot of information about video conferencing specifically in Kent:

<https://portal.klz.org.uk/collaborationsites/videoconf>

## **Online Resources**

There are many resources available online which discuss the different aspects of video conferencing. Rather than try and duplicate these resources, this document contains a list of links which we believe will be useful to you in assessing, setting up and running successful video conferencing facilities in your school. The list of links is by no means exhaustive but represents some of the material which we have reviewed and found useful.

If you find any other material which you think other schools would be interested in and should be included then please email the web address to [eis.support@kent.gov.uk](mailto:eis.support@kent.gov.uk) for review and inclusion.

**Video Conference Services:** <http://www.vcs-ltd.com>

Contains list of manufacturer websites and glossary of terms as well as other useful information

**JANET Video Conferencing Service:**

<http://www.ja.net/services/video/jvcs/gettingstarted/videoconferencingforschools.html>

Part of the JANET organization, this website provides excellent information on environmental issues and room setup and various fact sheets available in PDF format and everything that you need to know about JVCS.

**Global Leap:** <http://www.global-leap.com/>

This was originally a DfES project to develop video conferencing in the classroom and is now funded by UK school subscriptions. This UK site provides a timetable of video conferencing opportunities provided by the UK national museums and galleries that schools can book onto.

**Global School Net:** <http://www.globalschoolnet.org/gsnpr/>

Directory of international schools using VC

**Pacific Bell:** <http://www.kn.pacbell.com/wired/vidconf/>

Although American, this site contains a good list of further resources under the 'Videoconferencing Links' section and the site is aimed at educational based users. Also contains lists of other videoconferencing directories.

## **Frequently Asked Questions**

### **Can I use Netmeeting or Messenger for Video Conferencing?**

People often ask about using MSN or Windows messenger for video conferencing. MSN messenger uses it's own protocol and is aimed at consumers and not organizations. Windows Messenger is a client that will talk to both the MSN Messenger network using the MSNP protocol, or Live Communication Server using the SIP protocol. The old Netmeeting product was compliant with H323 but this is no longer supported and therefore not recommended. There can be problems loading it onto Windows XP PC's for example. Also the H.323 stack implemented in this software has not been updated for many years and therefore does not support many of the newer features and protocols implemented in more recent H.323 stacks.

The only video conferencing protocols supported over the KPSN network currently are H.323 and KLZ OCS SIP based clients. This is not to say that other video conferencing products won't work over the KPSN but they will not inter-operate with the EIS H.323 based infrastructure.

### **Should we use IP or ISDN for Video Conferencing?**

If you are on the KPSN broadband network then going for an ISDN video conferencing installation would be a mistake for the following reasons;

1. **BANDWIDTH:** A set of ISDN lines usually refers to 3 x ISDN2 to give 384k bandwidth. This is the current speed at which we run VC over the KPSN IP network. In future this could be increased further as more schools move to higher speed network connections. This is not really a viable option if you are using ISDN lines, you would be fixed at 384k
2. **COSTS:** To install the three ISDN circuits costs £199 each (Total - £597). BT then charge £93.06 per quarter per ISDN circuit so £1116.72 per year. On top of this every time that you make a call at 384k you will be charged effectively for SIX simultaneous phone calls! (These prices were taken from BT's website in June 2010). These costs could be reduced by only installing a single ISDN line to give 128k bandwidth calls but would obviously reduce the quality of the calls. (Annual cost for a single ISDN2e line excluding call costs would be £372.24)

To run your VC installation over the KPSN costs between £222 per annum with no setup costs depending upon the equipment that you are using to access the EIS provided central infrastructure.

3. **FUNCTIONALITY / CONNECTIVITY:** EIS have installed central video conferencing infrastructure to enable IP based calls over the KPSN to be made both between Kent schools and also outside of Kent. The EIS gatekeeper enables schools to make calls to each other via KPSN without any call charges being incurred. The EIS firewall traversal solution allows calls to be made between Kent schools and external organisations. The EIS gatekeeper is neighboured with the JANET video conferencing service which provides additional services to schools; QA testing, multipoint conferencing, ISDN gateway and conference recording to name the key ones.