

# **TF-Netcast Deliverable B: Report on Streaming Video Survey**

**Andres Steijaert  
Baiba Kaskina  
Dan Mønster**

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## Introduction

TERENA (Trans-European Research and Education Networking Association) carries out technical activities and provides a platform for discussion to encourage the development of a high-quality computer networking infrastructure for the European research community.

The TERENA community consists of NRENs (National Research and Educational Networks) from almost all European countries as well as from universities and research institutions. There are national, international and associate members in TERENA.

The TF-Netcast Task Force is established under the auspices of the TERENA Technical Programme to prepare the creation of a portal for live-streaming announcements and to investigate the possible extension of the portal to an academic channel for live-streams and video-on-demand.

During the second quarter of 2003, the TF-Netcast group conducted a survey within its member organizations and their users, to get a better understanding of the way streaming video is used within its community and the direction in which this technology is developing. The questions were prepared by Leif Laaksonen, Egon Verharen, Andres Steijaert, and Dan Mønster, and then turned into a web based questionnaire. The present document is deliverable B of TF-Netcast and it describes the results of this survey.

## Results

The survey was targeted towards people that regularly deal with streaming video: *content creators, video producers, ICT staff* and *project leaders*. In other words, the respondents are considered to be streaming specialists.

The questionnaire contained questions about the following subjects:

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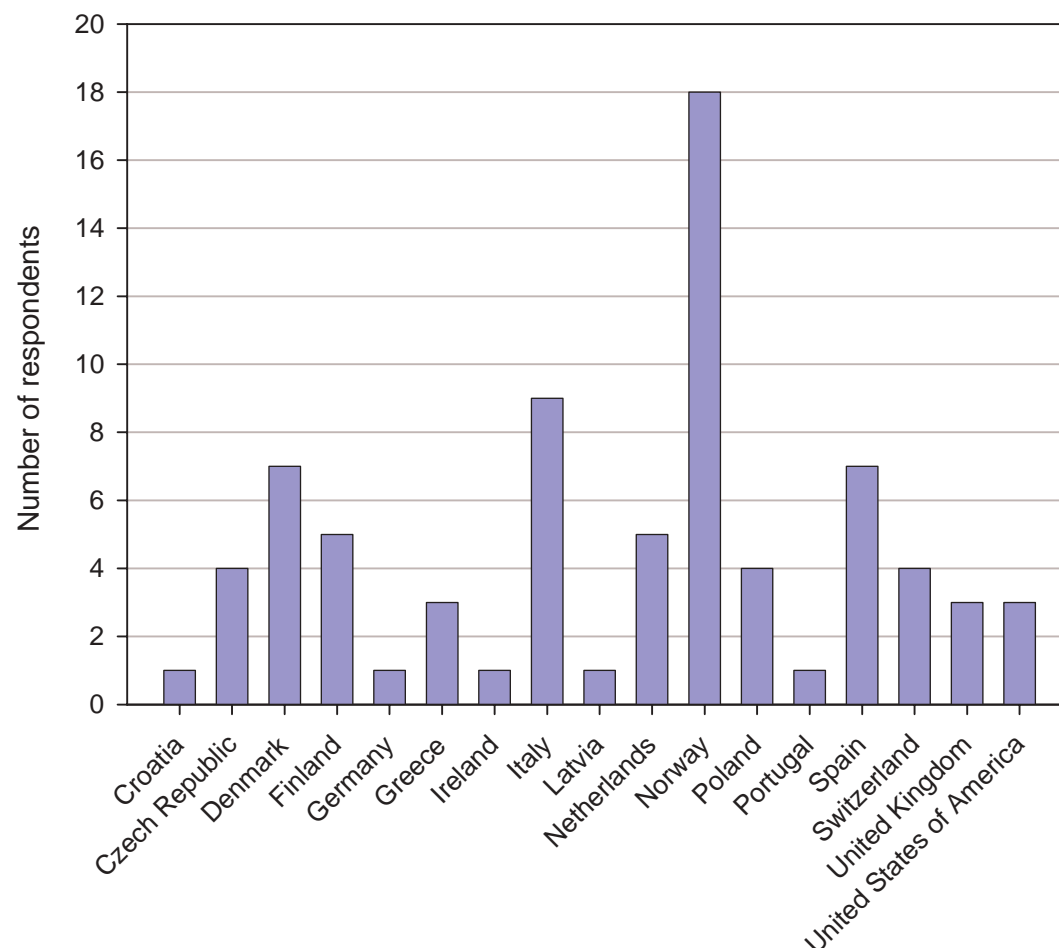
The questionnaire was organized in such a way that respondents would only be asked relevant questions, so that for instance a respondent would only be asked questions about encoding software and hardware if the respondent answered “yes” to the question “does your organization encode material for streaming?” A summary of the questionnaire and its branching is available in Appendix A. The questions have been



numbered Q1-Q112 and this notation will also be used in the main text to refer to specific questions.

A total of 77 respondents from 17 different countries participated in the survey.

#### Q6 Country

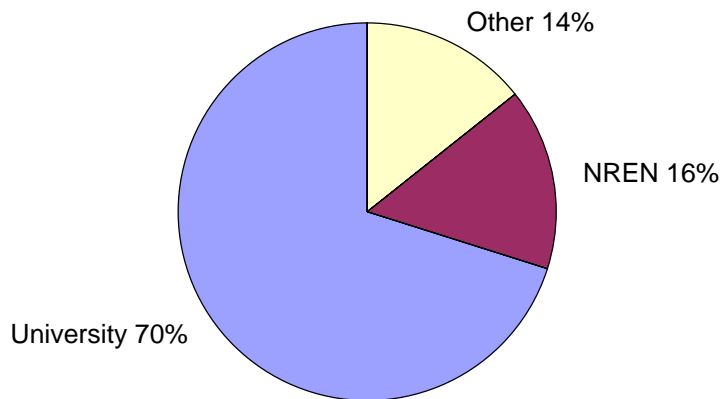


The largest number of respondents came from Norway – 18. Italy was represented with 9 answers, Denmark and Spain – with 7 each.

The type of represented organizations were as follows:



**Q5 Type of organization**

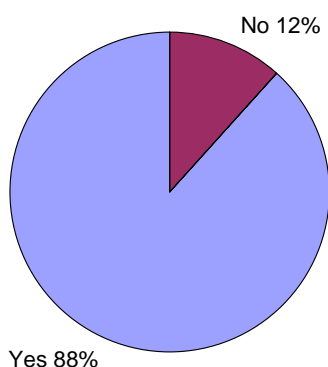


The majority of the respondents (70%) came from universities followed by National Research and Educational Networks (NRENs) (16%) and the remaining 14% from other institutions typically some form of higher education or research institution. This distribution in organizational type reflects both the contacts of the task force members and the usage of streaming media technology in the different types of organizations. It is pertinent to remember that the questionnaire only covers a very small part of the people who use streaming media in the academia, but on the other hand it is expected that we have reached some of the most advanced users in this survey.

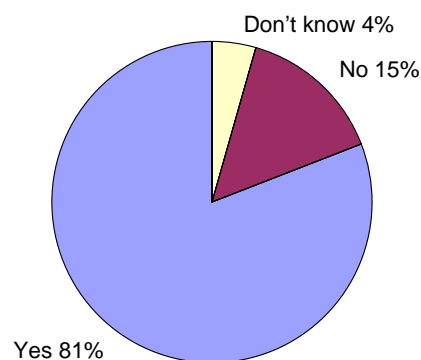
**1. Content for streaming**

88 % of the represented organizations stream audiovisual content and 81% of those organizations offer live streaming.

**Q18 Does your organization stream audiovisual content?**



**Q20 Does your organization offer live broadcasting?**



The respondents whose organizations stream audiovisual content were also asked what kind of content they stream, and the answers to that question (Q19) are reproduced in the box below.



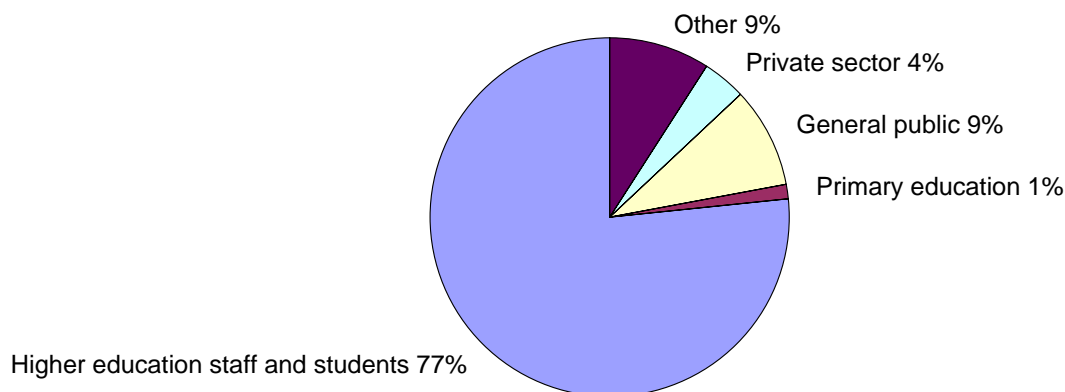
**The sort of material that gets streamed (live and on demand), is as follows (Q19)**

- Lectures
- Seminars
- Videoconferences
- Terrestrial TV
- Speeches at opening ceremonies etc
- Communication skills
- Special events
- Archival, educational etc.
- Surgical procedures
- Presentations about Academic Activities
- Educational films
- Meetings
- Radio and television programs, movies
- Student productions
- Conferences
- Combined with tasks in other curricula
- Course material
- Institutional Events
- Radio and TV
- Edited programs/triggers
- Practical situations for clinicians
- Live festivals
- Documentaries
- Research discussions, concerts, art,

The wide range of streamed material indicates that it could be interesting not only for the academic but also for other communities.

Most of the organizations (77%) target mainly higher education staff and students, while 9% say their target audience is the general public, and another 9% indicate an other target audience than one of the predefined categories. This is followed by the private sector (4%) and primary education was reported by only one respondent corresponding to approximately 1%.

**Q8 Please characterize the target audience to whom you offer streaming content**

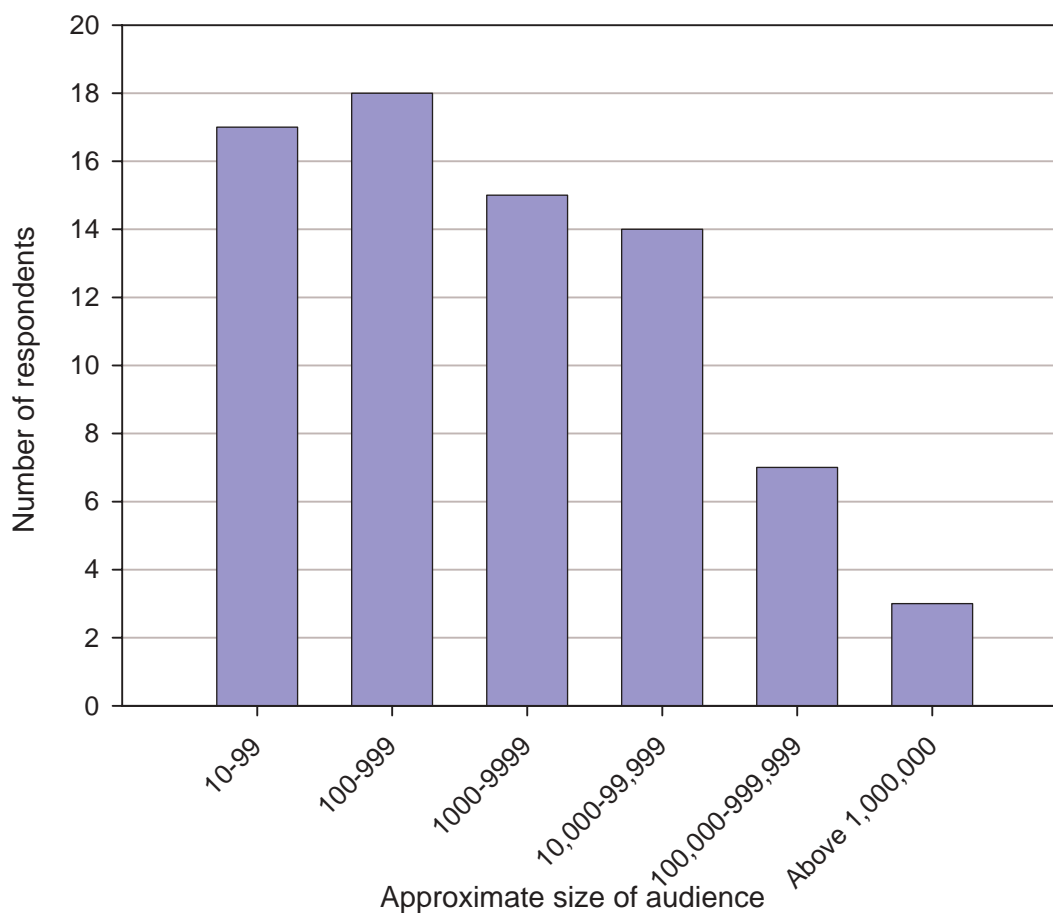


There is a large spread in the estimated size of the target audience between the different respondents. The lowest number reported is 10 and the highest number is 10 million. The distribution is shown in the graph below where the answers have been



grouped into different ranges. There is an almost even number of respondents in each range up to an audience size of 10,000 after which the number of respondents drop.

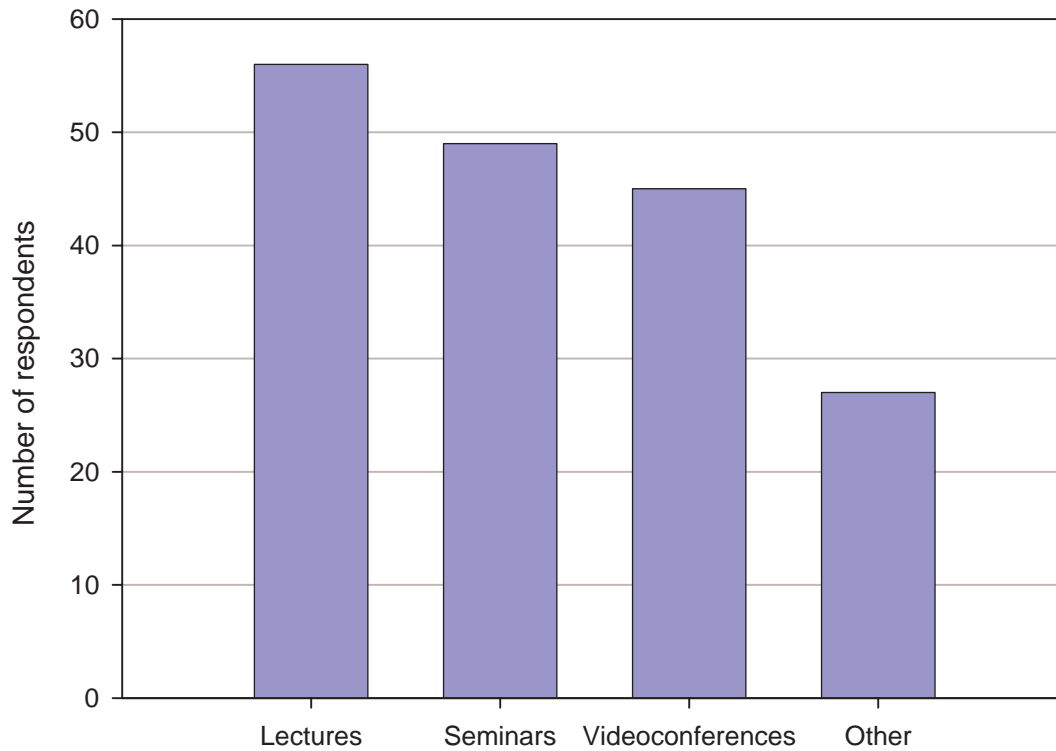
**Q9 What is the approximate size of your target audience?**



A wide range of different types of materials is being streamed as evidenced by the many different answers provided (see box on page 6) in addition to the predefined categories: lectures, seminars and videoconferences which all received a high number of responses as shown below.

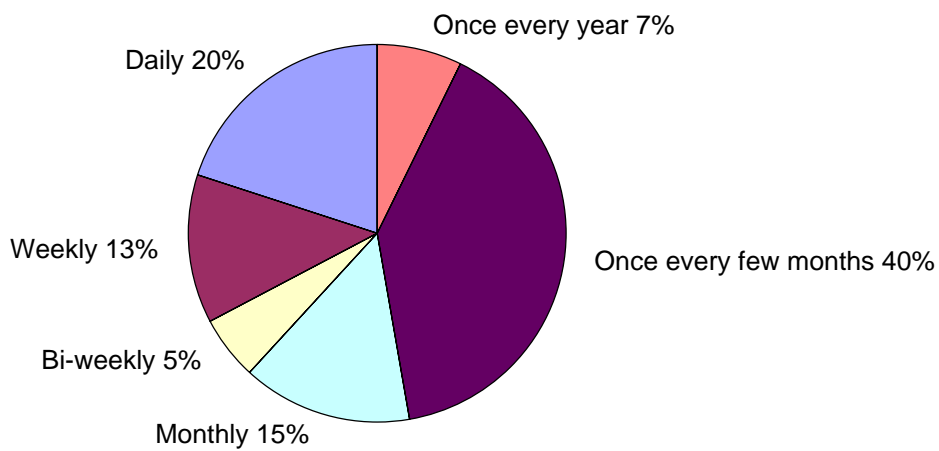


**Q19 What sort of material is streamed by your organization? (More than one item can be selected)**



55 respondents answered the question about how often live events are broadcasted. Roughly half of those respondents who stream live content do so at least on a monthly basis, while the other half do it less regularly. One fifth of the respondents stream live material on a daily basis. The detailed distribution of answers is shown below.

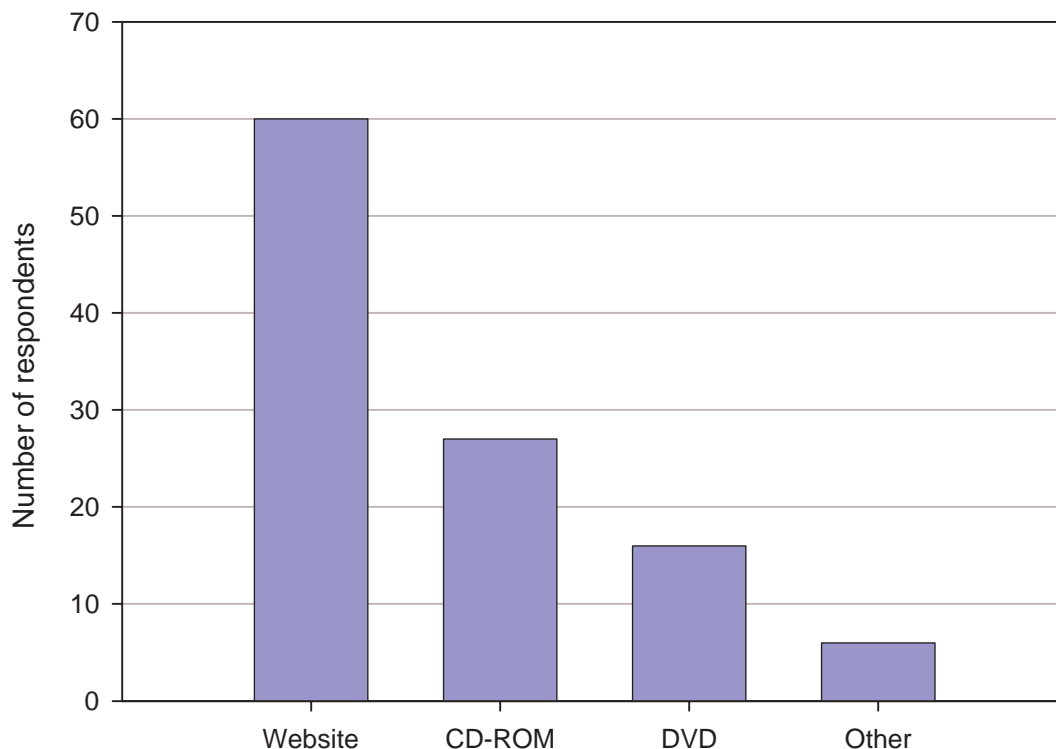
**Q21 How often do you stream live content?**





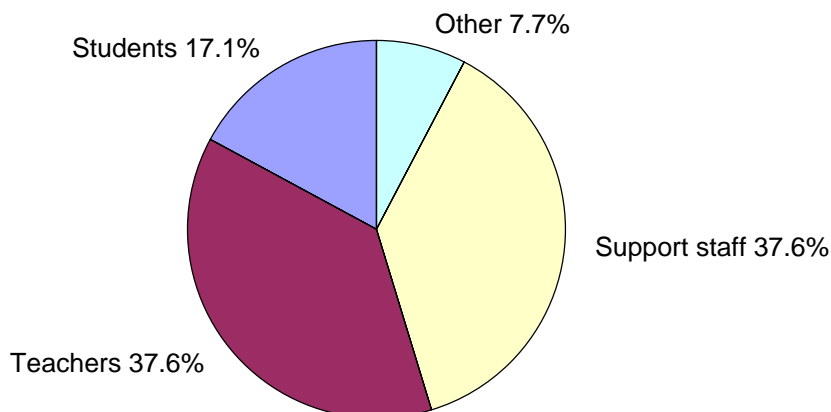
The internet is the most important distribution medium for getting video and multimedia material to the end users. 60 of the respondents indicate they also use websites. That is more than double the amount of respondents that (also) indicate to use a CD-ROM.

**Q26 What are, apart from streaming, the typical distribution media used for getting the content to the end users?**



Teachers and support staff are producing most streaming material. Only 20 respondents (17%) indicate that students are involved with creating streaming content.

**Q25 Please characterize the users that produce their own content within your organization**



The respondents were asked to provide information about the (streaming) video production and projects they have. The examples are very different and offer a good overview of streaming video activities in the community.



### Examples of (streaming) video productions and / or projects (Q17)

- <http://www.myecm.it/healthtv/filmato.php?id=13>
- Science forum 2003 together with FUNET <http://video.helsinki.fi/tieteenpaivat2003/default.htm>
- We are currently in pilot stage, no actual content is provided to students. Plans are to provide lectures. Also currently a student radio station is streaming on the net. <mms://video1.janet.lv/radio>
- Opening ceremony for University of Bologna: <http://www.cineca.it/streaming/aa2001>, [www.cineca.it/streaming/aa2002](http://www.cineca.it/streaming/aa2002). Opening ceremony for University of Padua: <http://www.cineca.it/streaming/unipd/aa2001/>, <http://www.cineca.it/streaming/unipd/aa2002/>
- ECM- Continuous Medical Education: Corso di Perfezionamento in "Stratificazione di Rischio e Trattamento delle Sindromi Coronariche Acute" [www.cineca.it/streaming/ecm2002](http://www.cineca.it/streaming/ecm2002)
- ECM- Continuous Medical Education IV Corso di Ecografia Clinica in Medici
- Industria e Ricerca: nuove prospettive di collaborazione Meeting: Industry and Research [www.cineca.it/streaming/ier](http://www.cineca.it/streaming/ier) --- XIV Convegno Nazionale INCONTRI CON LA MATEMATICA Sulla didattica della matematica e sulle sue applicazioni National meeting
- Course Mathematical Modelling, no traditional lectures (in co-operation with other Finnish universities) <http://alpha.cc.tut.fi/mallinnus/kurssit/jatkokurssi/> Workshop recordings: Industrial Mathematics Workshop <http://www.math.tut.fi/workshop02/ohj>
- Introduction to University of Tampere video  
rtsp://rm.tv.funet.fi:558/fi/tre01.rm in finnish  
rtsp://rm.tv.funet.fi:558/fi/tre02.rm in english
- Math course of Game Theory: [http://tdg.dima.unige.it/PhD\\_dsk0/lesson\\_5/5\\_1T1.htm](http://tdg.dima.unige.it/PhD_dsk0/lesson_5/5_1T1.htm)  
Chem Laboratory: <http://www.dima.unige.it/~guerceri/chimica.html>  
Lectures: <http://wave.mfn.unige.it/curriculum/20021125.html>  
Live Conference with live chat: <http://www.epfl.ch/epfltv>
- I am writing this as a representative of the 'Davideon' project. This is specifically aimed at opening up the archives of the National Institute for Image and Sound (e.g. digitizing part of it) for research and educational purposes. This is a joint effort  
<http://www.rug.nl/let/voorzieningen/ictol/projecten/davideon>
- Live streams considering seminars, conferences and lectures, self-learning material production from lectures. One example (in Finnish only, sorry) can be found in address: <http://media oulu.fi/TAKOMO/ESP/video.php> (you may try this using real one player.)
- We have three years of experience with on-demand streams of surgical procedures, which are used every day. We have one experience with live streaming where we streamed a 3 hour session of three surgical procedures to an audience in Bella Center 10 km away. The audience were dentists in continuing education course. There were about 350 participants
- SURFnet Video Portal: <http://video.surfnet.nl>
- Lectures of Academic Education Programmes Presentations of Academic Activities (<mms://vod.upnet.gr/upnet2002.wmv>) Help-desk guidelines for the use of network services University Radio (coming soon)
- Distance learning on more universities (not for general public) General archive (<http://www.cesnet.cz/archiv/video/>) Announcement portal (<http://prenosy.cesnet.cz>)
- Resources not yet operational. Mainly used for research purposes. Please refer to <http://diuf.unifr.ch/im2/> for further informations about the background of our research.
- Av@lon project: <http://coo.let.rug.nl/avalondemo> Davideon project: <http://www.surf.nl/projecten/index2.php?oid=115> Virtuele Snijmachine: <http://www.surfnet.nl/snijmachine> All three sites in Dutch only
- Real and quicktime streaming for smaller audiences <http://www.net.ethz.ch/streaming/index.html> <http://www.unitedvisions.tv> MPEG-1 and MPEG-2 multicast streaming for large audiences <http://www.iptv.ethz.ch>
- Please see <http://www.heanet.ie/projects/videoservices/videostreaming/index.html> or <http://www.heanet.ie/services/videoservices/videostreaming/index.html>
- Pioneers in Biology <http://www.pioneers.au.dk>
- RoboCup 2001 <http://www.forskningsnettet.dk/robocup/>
- Lifesign: [www.lifesign.ac.uk](http://www.lifesign.ac.uk)
- [www.swan.ac.uk/lis/cdi](http://www.swan.ac.uk/lis/cdi)
- 24 channels of MPEG-1 multicast. Was in production but currently in test because of multicast problems on campus network. <http://www.unc.edu/video/multicast/index.html>
- Brief clips of interviews w/working journalists <http://depts.gallaudet.edu/journalism/rm/> Live event coverage - Commencement, convocations
- Demo page: <http://www.usit.uio.no/it/dlo/lab/demo/> Webcasted conference: <http://www.uio.no/adl/konferanse2001/video/>



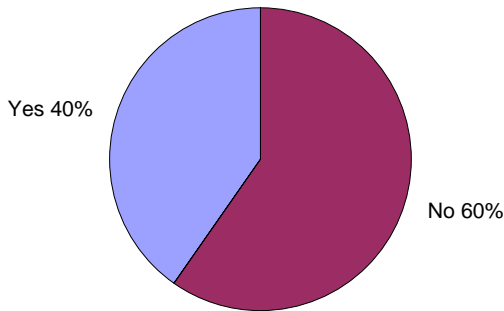
- Projects including: Advanced Telematics Centre - concentrated on media streaming <http://www.telematics.eu.org> Click and Go Video - Introduction, support, and development of streaming technologies for the institution. <http://www.clickandgvideo.ac.uk>
- Streaming of NRK's (Norwegian Broadcasting Corporation) radio and TV channels (unicast, multicast, IPv4, IPv6): <http://media.hiof.no> Radio on demand (currently in the process of a redesign): <http://rodcast.hiof.no>
- On-demand streaming: \* Gilgamesh - The Digital Library Book - uses streaming for delivery audio content: <http://gilgamesh.psnc.pl/>
- [www.nkul.no](http://www.nkul.no) Live streaming of National Conference In addition we produce lectures with video of the lecturer synchronized with Slides using SMIL
- Streaming from local council meetings, lectures, education, guidance From education: [http://webster.hibo.no/afn/fjordskolen/kveite\\_dell\\_56kbps/](http://webster.hibo.no/afn/fjordskolen/kveite_dell_56kbps/)
- [www.farnboroughsf2.ac.uk](http://www.farnboroughsf2.ac.uk)
- We do streaming for producing video-based short lectures as part of learning material, both for campus students and for remote target groups undergoing continuing education. A few examples on stream-clips: <http://www.hig.no/at/hilding/el-ikt/blekksk>
- e-learning, conferences, video [www.hoyvis.com](http://www.hoyvis.com)
- <http://noc.auth.gr/services/vod>
- <http://vod.grnet.gr>, [http://vod.grnet.gr/vod\\_yliko.html](http://vod.grnet.gr/vod_yliko.html), <http://vod.grnet.gr/cgi-bin/mbone.cgi>
- <http://multimedia.hint.no> (Only in Norwegian)
- Lectures <http://www.comtel.cz/vyuka/predmety/predinfo/prednaska?kod=26&typ=p> files named "stream"
- Online streaming of Conferences and lessons. <http://streaming.units.it/Didattica/lezionieventi.htm>  
<http://www.univ.trieste.it/~nirtv/stream.html>
- [http://www.rediris.es/mmedia/tut\\_com/](http://www.rediris.es/mmedia/tut_com/)  
<http://www.rediris.es/jt/jt2001/archivo-jt.es.html> <http://vrvs.rediris.es/mbase/user/home.ksp>
- <http://scsx01.sc.ehu.es/scwfacvi/streaming/> <http://scsx01.sc.ehu.es/scwfacvi/streaming/VoD.html>
- <http://multimedia.ehu.es/> (Website of our research group) <http://multimedia.ehu.es/cast/demos.html> (streaming demos)
- Project "ADAMADRID" (ADAMADRIDTV) <http://adamadrid.uc3m.es> Project "UC3MTV" <http://audiovisuales.uc3m.es> Project "VoD under UC3M" <http://besippo.uc3m.es/mbase>
- <http://www.fccn.pt/crc2002/v2/arquivo.htm> [http://www.fccn.pt/gridcomputing/arquivo\\_delfino.html](http://www.fccn.pt/gridcomputing/arquivo_delfino.html)
- <http://gorgons.fccn.pt/arquivo/fcg/20030325/> <http://gorgons.fccn.pt/arquivo/fcg/20030415/>  
<http://gorgons.fccn.pt/arquivo/oal/20030328/>  
<http://gorgons.fccn>
- URJC-TV URL: [http://chaplin.urjc.es/z\\_files/aj\\_comu/aj04/URJC-TV.php](http://chaplin.urjc.es/z_files/aj_comu/aj04/URJC-TV.php) Contenidos Videos bajo Demanda URL: [http://chaplin.urjc.es/z\\_files/aj\\_comu/aj04/Contenidos.php](http://chaplin.urjc.es/z_files/aj_comu/aj04/Contenidos.php)
- Streaming of conferences in MP4 (live) , streaming of public channel ([www.openchannel.no](http://www.openchannel.no))
- 1: Medical Education, university/MD degree level: cases - patient & doctor situations (streaming video)  
2: Law Studies: Law lectures held online for large client (streaming video) 3: High School as e-learning: online & live classrooms, streaming video,
- <http://www.researchchannel.org/> over 1500 hours of broadcast quality programming available in windows media and ibm videochanger multicast broadcast quality 7x24 programming stream high definition vod streams
- University TV channel. Information about our University
- Interactive real time concert with the Warsaw Autumn Festival, The Sibelius Academy and Notam/Mediaculture studio,Oslo University. "Sept. 11. as Cultural Trauma in The USA" (with Neil Smelser), "From the Sea to the Mountains" (series on Norwegian Fauna)
- <http://www.sfera.umk.pl:8000>
- CARNet's Video Network (currently under minor construction) - <http://cnvm.carnet.hr> CARNet's Internet TV - <http://tv.carnet.hr> - 24/7 netcast on 5 channels
- Currently Live on iTV2 - Third apostolic visit by Pope John Paul II to Croatia, from June 5 to 9 CARNet's MoD service - <http://mod.carnet.hr> - Multimedia Archives of major events - latest update - TNC&CUC 2003
- I have put a seminar about multicast, to be streamed in multicast, at <http://infocom.uniroma1.it/alef/mmedia/sem/semplay.html>. I have created an Internet TV by means of the MPEG-4IP project, at <http://genni.ing.uniroma1.it/nuke/modules.php?name=Con>
- VideoPoort is a solution to encode Windows Media for students and staff, it encodes, gathers METADATA and sends an e-mail, with a VideoLink and a link to the virtual editing machine, (SURFnet) <http://www.ictolland.nl/videoport/videoport1.html> (in Dutch)



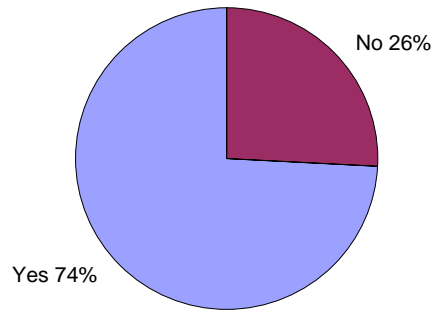
## 2. Streaming portal

40% of the respondents said their organization has a streaming portal or a streaming announcement portal (Q29). Of those 74% further said that their organization has a video archive (Q31) and 35% of those indicate that the archive is searchable (Q32). 58% of the respondents who have a portal (Q29) say that they have further plans to announce videos to end-users (Q30).

**Q29 Does your organization have a streaming portal or streaming announce portal?**



**Q31 Does your organization have a video archive?**



### Examples of streaming portals (Q29)

- <http://audiovisuales.uc3m.es>
- <http://chaplin.urjc.es>
- <http://genni.ing.uniroma1.it/labtel/>
- <http://www.intermedia.uio.no/kunnskapskanalen>
- <http://media.hiof.no>
- <http://multimedia.ehu.es/>
- <http://multimedia.hint.no>
- <http://nrk.no/kunnskapskanalen>
- <http://prenosy.cesnet.cz/>
- <http://scsx01.sc.ehu.es/scwfacvi/streaming/>
- <http://streaming.units.it>
- <http://tmk.odont.ku.dk/undervisning/video>
- <http://tv.carnet.hr>
- <http://tv.funet.fi>
- <http://video.surfnet.nl>
- <http://vod.grnet.gr/cgi-bin/mbone.cgi>
- <http://vrvs.rediris.es/mbase/user/schedule.ksp>
- <http://www.edu-media.dk>
- <http://www.epfl.ch/epfltv>
- <http://www.heanet.ie/multimedia>
- <http://www.ict holland.nl/videopoort/videopoort1.html>
- <http://www.myecm.it/healthtv/>
- <http://www.uninett.no/multimedia/streamingguide>
- <http://www.usit.uio.no/it/dlo/lab/>

### Examples of video archives (Q31)

- <http://www.myecm.it/healthtv/>
- <http://www.epfl.ch/epfltv>
- <http://www.cesnet.cz/archiv/video/>
- <http://coo.let.rug.nl/avalondemo/avalon/avmateriaal.html>
- <http://www.heanet.ie/projects/videoservices/videostreaming/index.html>
- <http://www.edu-media.dk>
- <http://tv.funet.fi/media-arkisto/>
- [http://vod.grnet.gr/vod\\_yliko.html](http://vod.grnet.gr/vod_yliko.html)
- <http://multimedia.hint.no>
- <http://streaming.units.it/Didattica/lezionieventiinternet/eventiregistrati.htm>
- <http://vrvs.rediris.es/mbase/user/list.ksp>
- <http://audiovisuales.uc3m.es>
- [http://chaplin.urjc.es/z\\_files/aj\\_comu/aj04/Catalogo/catalogo.php](http://chaplin.urjc.es/z_files/aj_comu/aj04/Catalogo/catalogo.php)
- <http://mod.carnet.hr>

The respondents have provided examples of their streaming portals and video archives. These examples showed wide variety of used techniques, complexity of the portals, different designs and approaches.

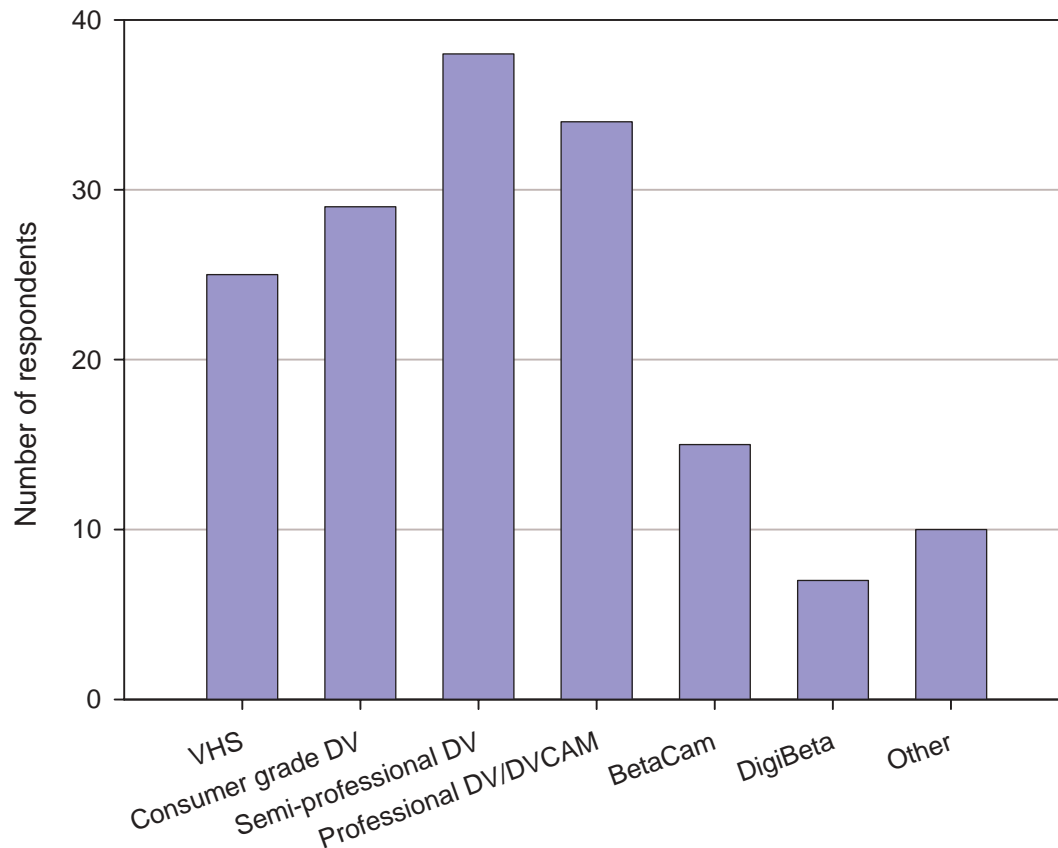
As only 40% of respondents claim that they have a streaming portal or streaming announcement portal, there is a possibility for TF-Netcast to assure these organizations to join TF-Netcast’s announcement portal.



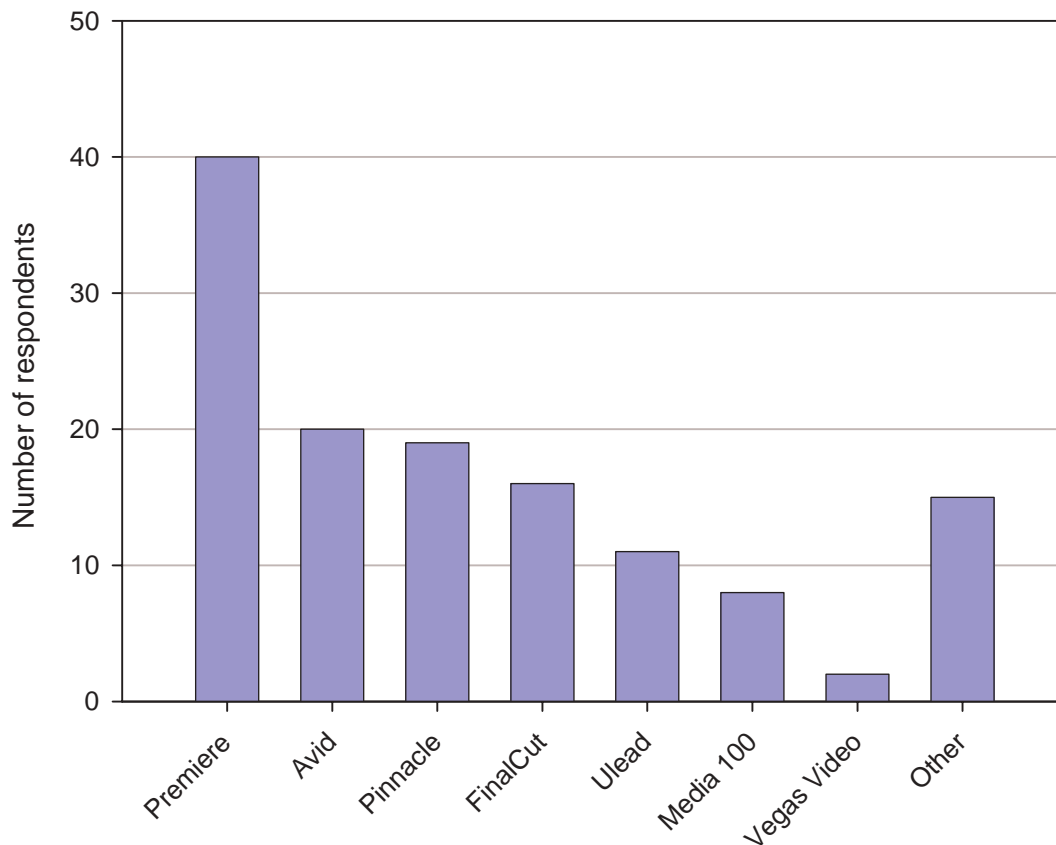
### 3. Camera and production equipment

A wide range of different types of camera equipment is used, ranging from VHS through various qualities of DV and DVCAM to professional broadcasting grade equipment and even a single respondent reporting the use of HDTV. The most popular type of equipment is semi-professional DV and taken as a whole the various grades of DV and DVCAM is by far the most used type of camera equipment. It is surprising that a relatively large number (25) report using VHS considering the poor quality of this type of equipment.

**Q37 What kind of camera and audio equipment are used within your organization? (More than one item can be selected)**



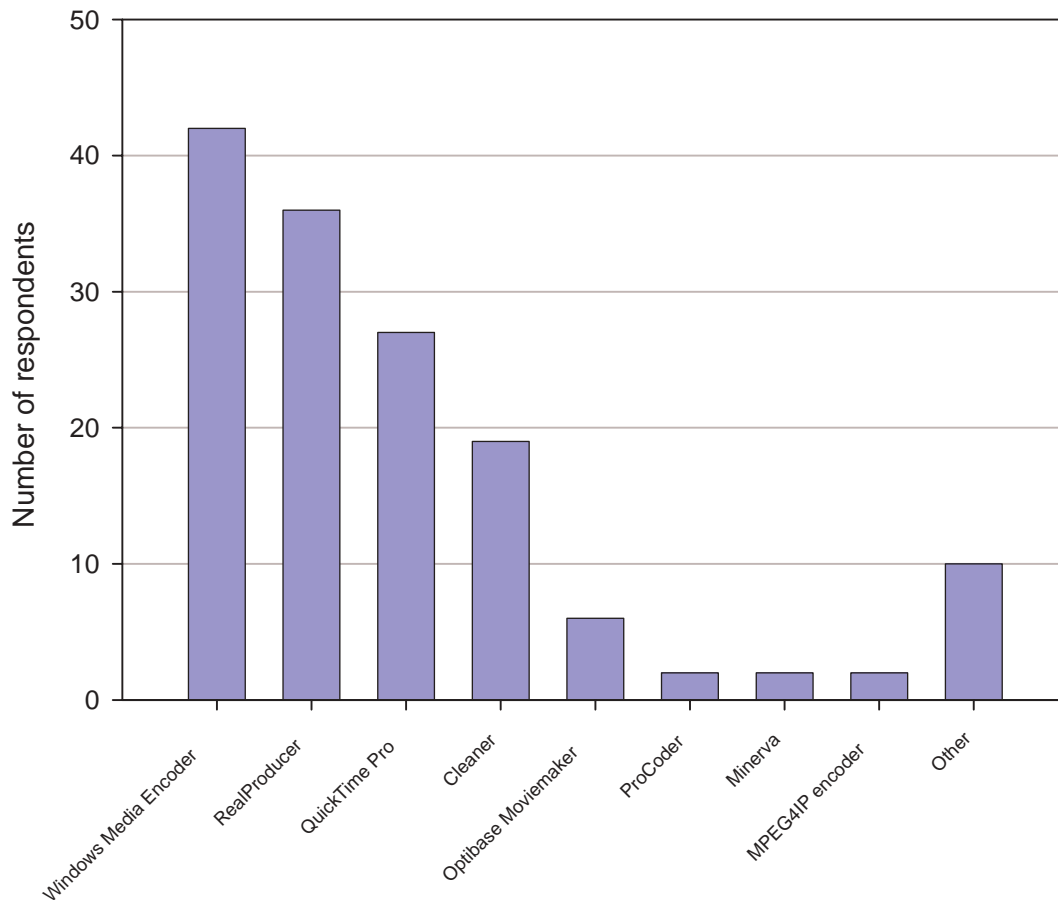
Many different kinds of non-linear editing software is being used, but by far the most popular is Adobe Premiere, which is being used by 52% of the respondents. The chart gives an overview of some of the different tools that are used. The category “other” includes such programs as Broadcast 2000, MainActor, Windows Movie Maker, iMovie and others. None of these were reported as being used by more than one respondent.

**Q38 What kind of video editing equipment is used? (More than one item can be selected)**

Windows Media encoder is the most popular encoding tool, followed closely by RealProducer and with QuickTime Pro as the third most popular tool. In fourth place is Discreet's Cleaner which can encode a source file to multiple formats. Canopus' ProCoder which has capabilities similar to those of Cleaner does not seem to be very popular. Optibase Moviemaker seems to be the most popular tool for encoding MPEG Content, followed by Minerva. MPEG4IP provides an alternative to QuickTime Pro for encoding ISMA compliant MPEG-4 files. The "other" category contains software and hardware encoder that were only reported by a one respondent and this category contains responses such as: Envivio MP4 encoder, FFMPEG, FlipFactory, and Pinnacle StreamFactory.



**Q41 What software or hardware encoding tools are used within your organization? (More than one item can be selected)**



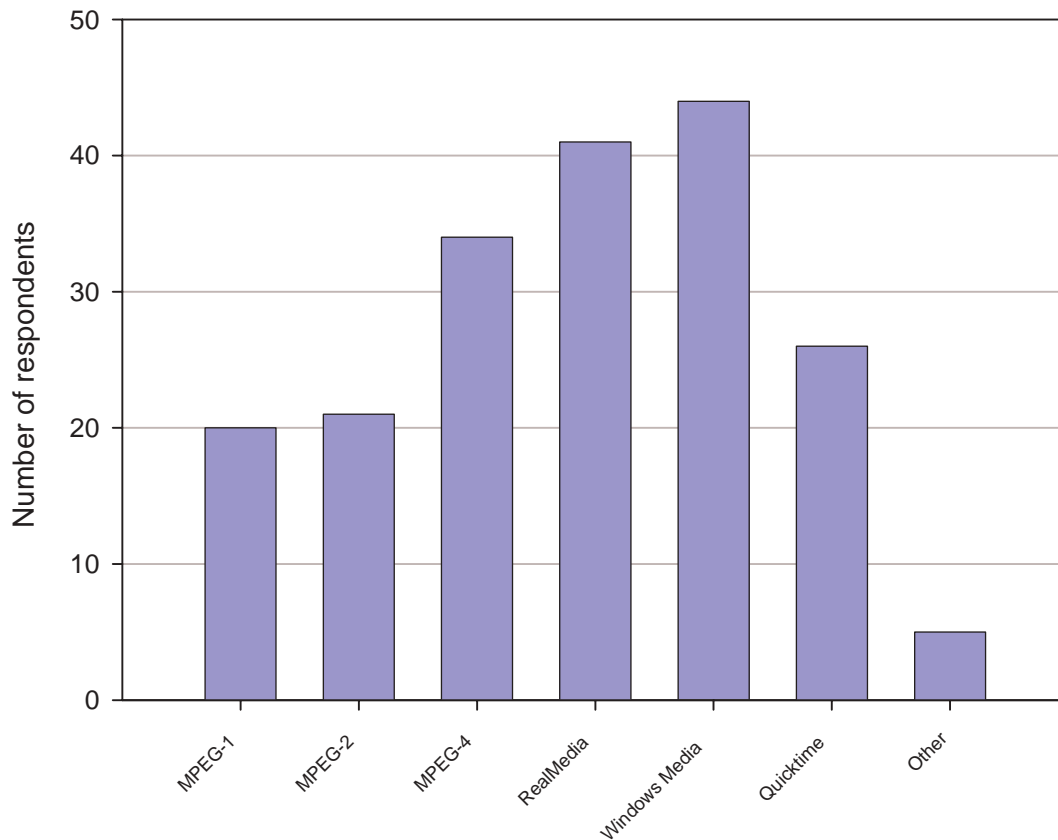
#### **4. Streaming servers**

62 of the respondents (81%) answered yes to the question “does your organization operate any streaming servers?” Those respondents were asked further questions about the servers, formats and platforms they used.

Windows Media is the most popular streaming format as 44 respondents indicate to use this format. Windows media is closely followed by Real, with 41 respondents using this file type. The MPEG-4 format is in third place, used by 34 respondents. MPEG-1, MPEG-2 and QuickTime are less popular but still widely used, and 5 respondents indicate that they use other formats as well including H.261 and H.263.



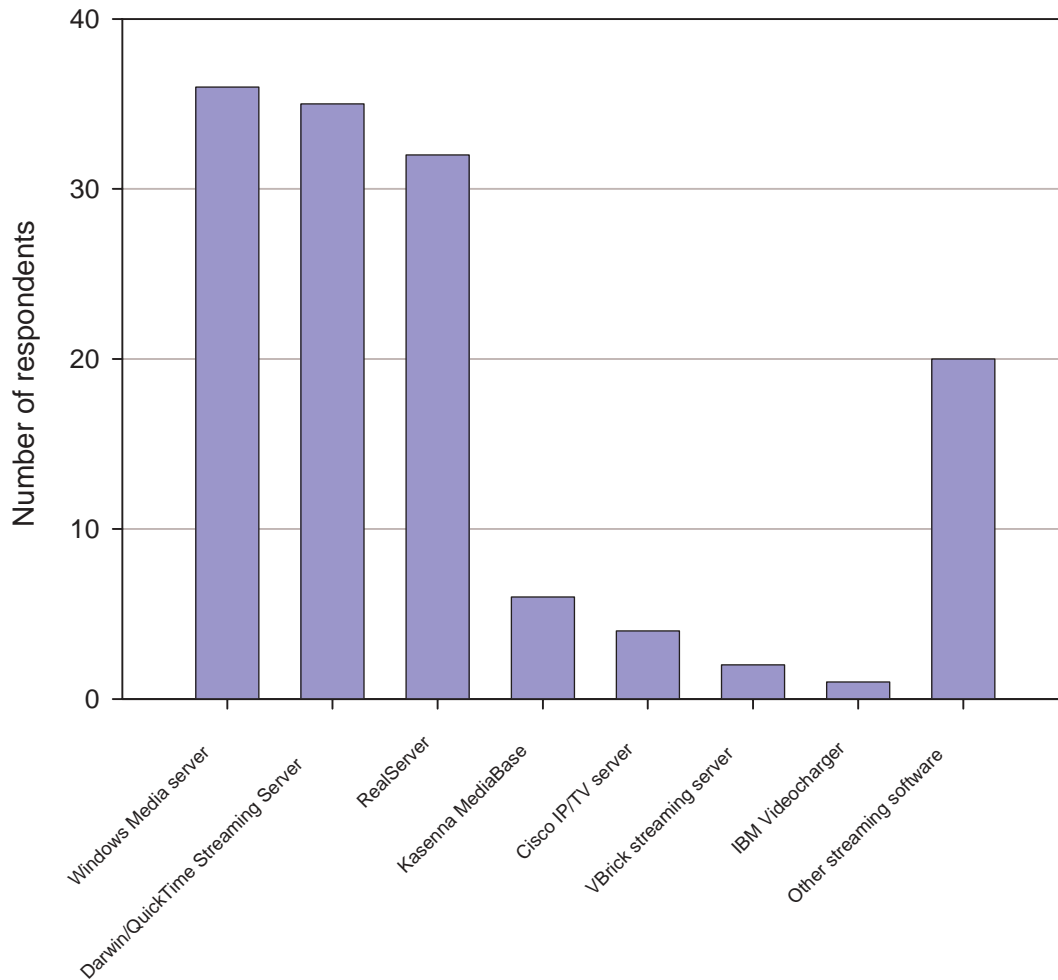
**Q43 What types of streaming formats are used within your organization? (More than one item can be selected)**



The answers to the question about the types of streaming servers used are in line with the used streaming formats. Thus Windows Media server reported as used by 36 respondents is the most popular streaming server, but almost equally popular is Darwin Streaming Server and QuickTime Streaming Server which when combined is reported by 35 respondents—only one less than Windows Media server. Not far behind, in third place, is RealServer which is used by 32 respondents. As could be expected there is significant domination by the “big three” on the streaming server market: Microsoft, Apple and RealNetworks. Far less used is Kasenna MediaBase (6 respondents), Cisco IP/TV (4 respondents), Vbrick streaming server (2 respondents) and IBM VideoCharger (1 respondent). Still 20 of the 62 respondents reported using other (non-listed) streaming server software including: Icecast (4 respondents), VideoLAN server (3 respondents), Optibase (2 respondents), Minerva (2 respondents) and Polyspan StreamStation (1 respondent).



**Q46 Which of the following servers do you use? (More than one item can be selected)**

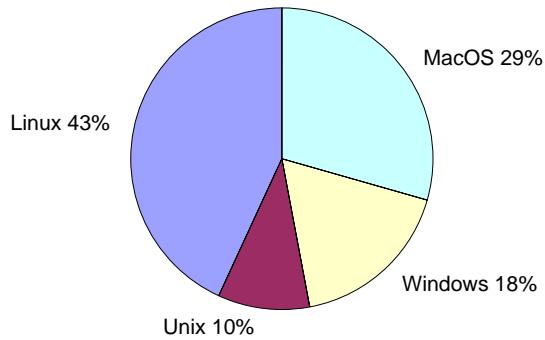


The respondents were asked to report on which operating system platforms they had the various servers deployed, and for those servers that are available on multiple platforms the results are shown in the graphs below. It is interesting to note that for both Darwin/QuickTime Streaming Server, RealServer and servers in the “other” category Linux accounts for roughly 40-45% and Unix accounts for roughly 10%. The remaining roughly 50% is shared between Windows and MacOS (and for the “other servers” category also “other operating systems” which probably accounts for embedded systems running a special or unknown operating system). Kasenna MediaBase is only available on Linux, Solaris and IRIX and of the six respondents using MediaBase three were using it on Linux, one on Unix and two did not respond which.

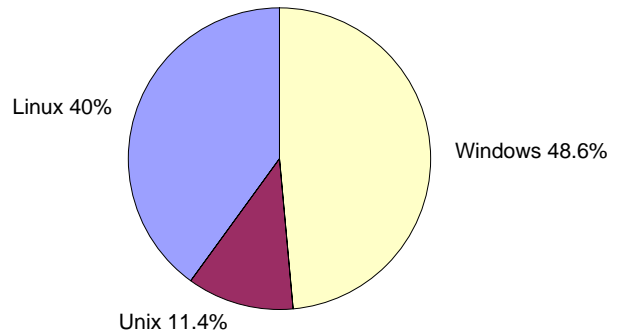
Considering that MacOS X is a Unix variant and that Linux is for all practical purposes also a variant of Unix it seems safe to conclude that—given the choice—users prefer a Unix-like operating system for running their streaming servers. But the results also indicate that MacOS competes more with Windows than with traditional Unix platforms and Linux.



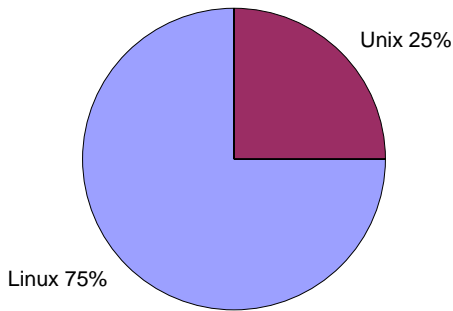
**Q50+Q64 On which of the following operating systems do you run Darwin/QuickTime Streaming Server?**



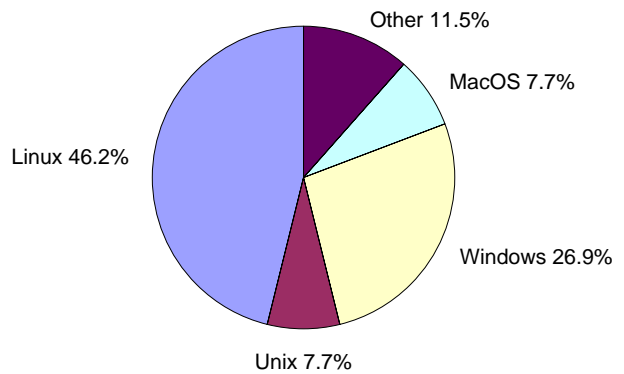
**Q58 On which of the following operating systems do you run RealServer?**



**Q54 On which of the following operating systems do you run Kasenna MediaBase?**



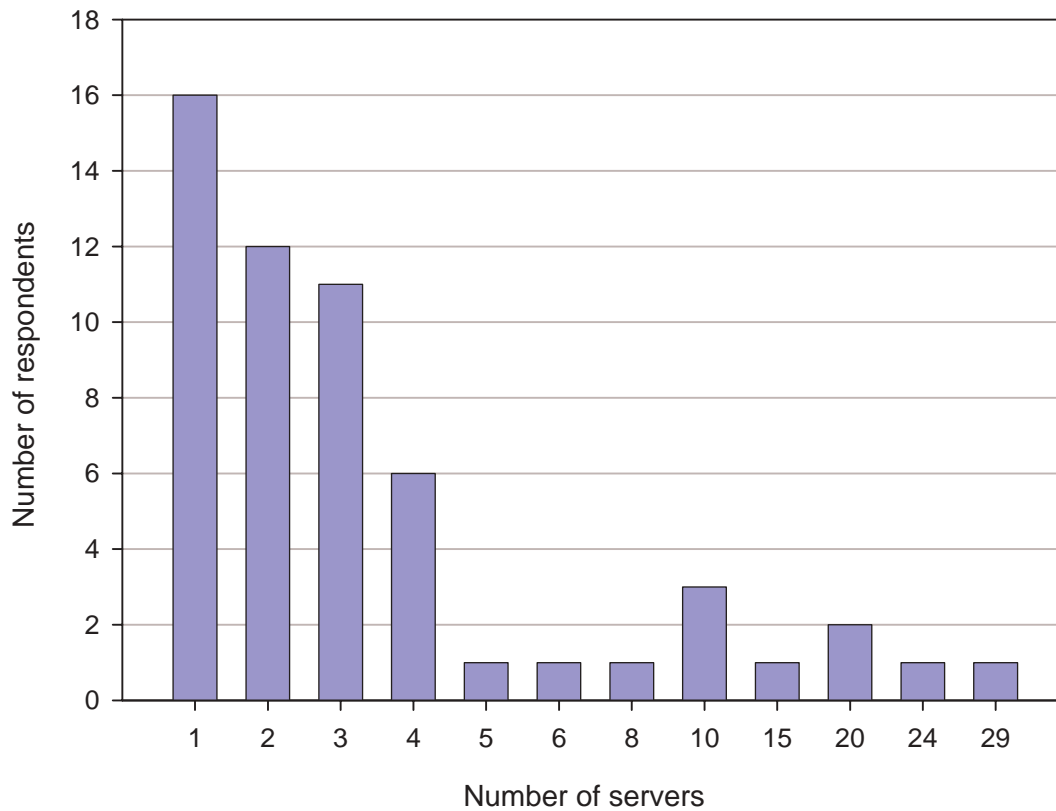
**Q67+Q71+Q75 On which of the following operating systems do you run the other streaming servers?**



Most of the respondents report using only one server with a diminishing number of respondents reporting using two, three and four servers. The majority of respondents report that below five servers were used with their organization, but some use a larger number of servers. The full list of responses is shown in the graph below.



**Q76 How many hardware servers (machines) are used within your organization?**



Some interesting facts about the streaming servers could be extracted from the survey.

**Quick facts**

**Stream license**

17% of the respondents have ever reached the maximum of their concurrent stream license(s).

**Flat file distribution**

28% of the respondents also distribute their content as flat files. They use (progressive) download through HTTP and internal file servers.

**Content Distribution Network**

13% of the respondents deploy a Content Distribution Network, or any other form of content replication between the servers.

Only 7 respondents indicate they would like to join a larger Content Distribution Network. Just 4 people would you like to participate in activities where their Content Distribution Network is used for distributing events from other organizations.

**Maintenance**

95% of the respondents maintain their streaming servers in-house. Only 5% outsource these activities.

**Load balancing**

11% use a form of load balancing equipment.

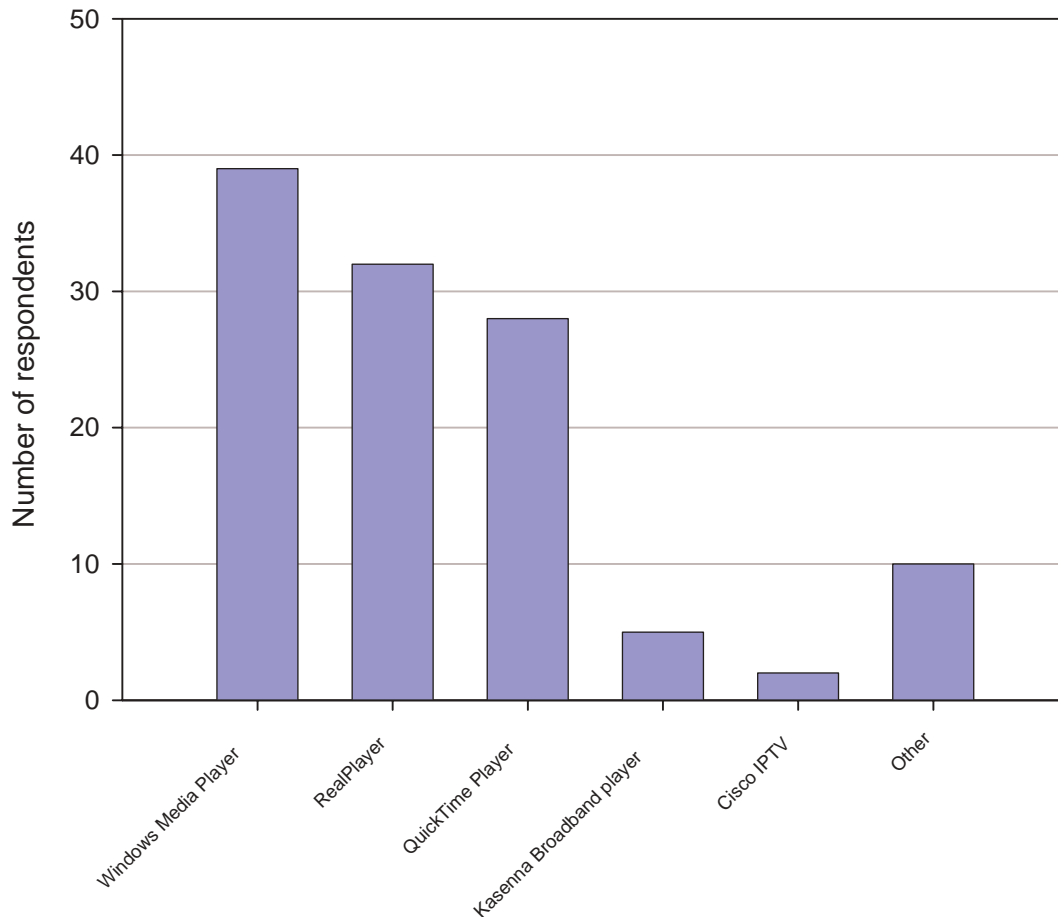
Examples are DNS round robin and a set-up where several Windows Media servers reference the same .asx file.



## 5. Media players

50 respondents (65%) say their organization supports and/or recommends the use of specific player software to their end users. The distribution in player software used mirrors the distribution of servers used, although Real and QuickTime have changed places relative to the server situation, but they are still close. Windows Media Player is reported as being used in the organization by 39 respondents, followed by RealPlayer (all versions including RealOne) reported by 32 respondents and QuickTime Player reported by 28 respondents, as shown in the graph below.

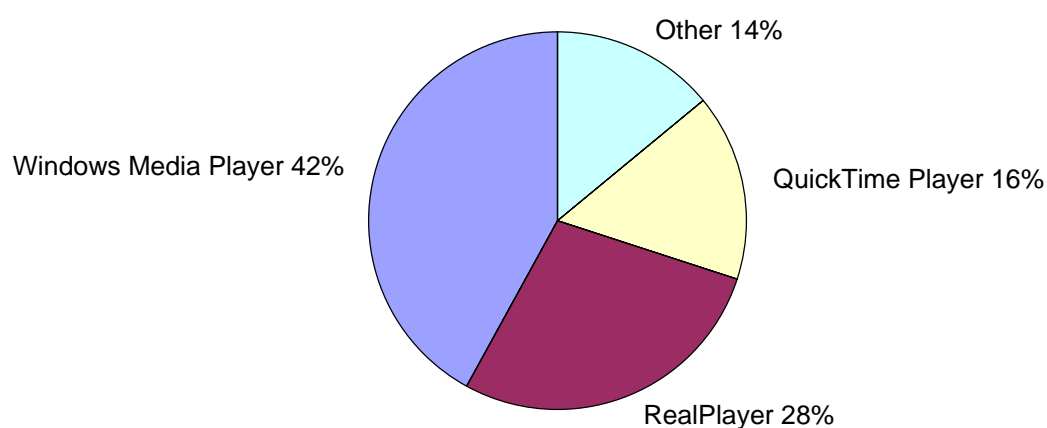
**Q88 What media player software do you use on the computers within your organization? (More than one item can be selected)**



Respondents were also asked to report which player they preferred. Windows Media Player is by far the most popular player, preferred by 42% of the respondents, followed by RealPlayer, preferred by 28%, and QuickTime Player, preferred by 16%. A relatively large fraction of the respondents (14%) said they preferred another player not listed.



Q89 What is your preferred player / favorite player?

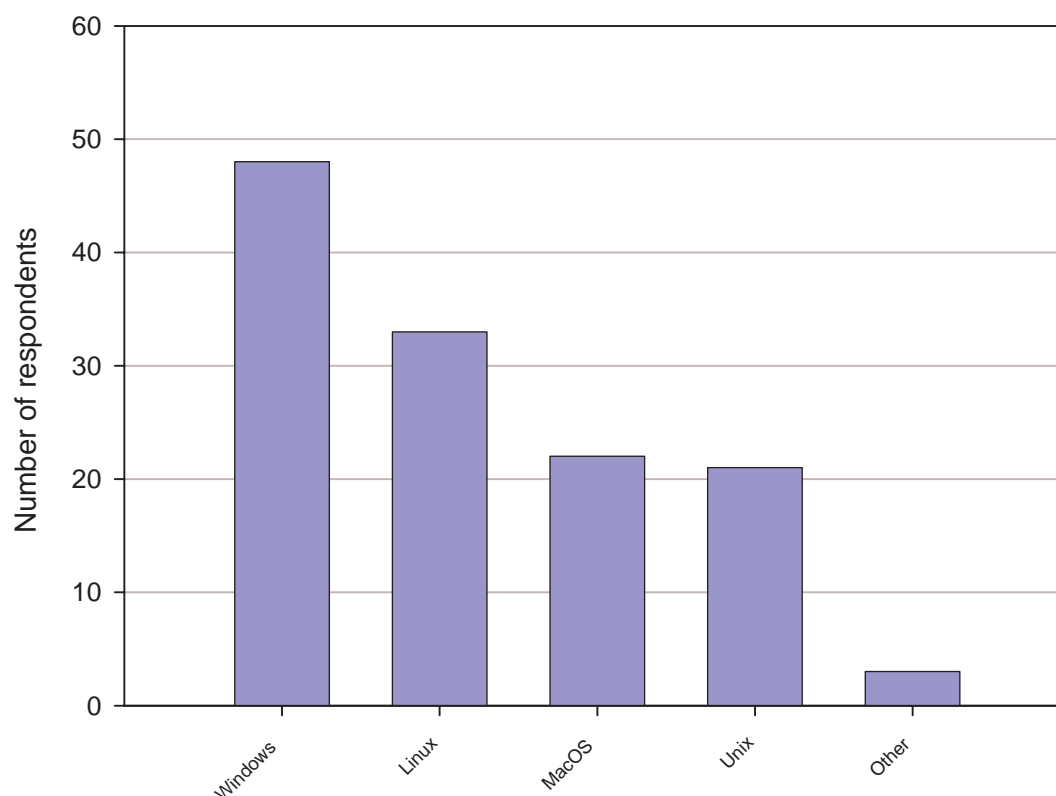


27% uses extra decoders (for example a software MPEG-2 decoder). The following types are mentioned:

- In-house made MPEG-2 decoder mainly for digital IP-TV (digital TV over IP)
- Minerva MPEG 2 codec
- MediaMatics MPEG-2 software decoder for Kasenna MediaBase
- Vidoeplex
- Bitcasting MPEG-1 for RealPlayer
- Elecard
- Hardware MPEG-2 decoder (edje 1013)
- WinDVDs filters for MPEG-2



**Q94 What platforms are supported within your organization? (More than one item can be selected)**



The majority of organizations support the Windows platform (48), but it is quite closely followed by Linux (33) and it could be predicted, that the number of Linux supporting organizations will increase.

The survey has gathered some thought-provoking user comments about the media players.

#### **User comments about the media players**

We are awaiting (and developing ourselves) Linux support for the Windows Media Player. Indexing in Windows Media Player is currently not (well) supported on MacOS or Linux. For these audiences we are forced to rely on RealPlayer for certain content.

I recomend vlc player (for MPEG-1&2&4) and windows media files (no .asx and .nsc files)

If Linux can't manage the format of the stream, the stream do not exists for me.

RealPlayer plugins don't exist for RealONE (Bitcasting MPEG)

It is up to the user to download the player they need.

We see a problem in the fact that Microsoft Windows Media Player does not support ISO MPEG-4 now gradually growing into a world standard for dynamic media. We also see the Microsoft domination as a problem for the development of open standards/players

We are waiting for xine and winamp support for the theora codec.

We use a web page script that detects OS/browser/players installed in the user PC and provide information about what is needed for streaming visualization.



RealOnePlayer is causing more and more resistance by Windows users because of its spyware and ad-push features.

Freeware players used, because almost everyone have the Windows Media Player and Real player is suitable for Linux and Unix users too.

Player must be multiplatform!

There are problems with all the players. It is difficult to find a player/format that is supported on all platforms. Standardization is badly needed (ISMA is our hope so far).

We want to get away from proprietary players.

Difficult to keep user base up to date with frequent updates.

## 6. Network

The respondents were asked to give some details about their organization's network, and 55 respondents answered these questions. The results showed that:

86% of the respondents specify their organization makes use of a switched network.

27% of the organizations block UDP traffic.

84% of the respondents backbone and 88% of their local network are multicast enabled.

25% indicate that they experience firewall problems.

These results show that there is a relatively large penetration of multicast both in the backbones and on the local area network. Whether this conclusion extends to organizations not covered in this questionnaire is uncertain, but it would be interesting to know.

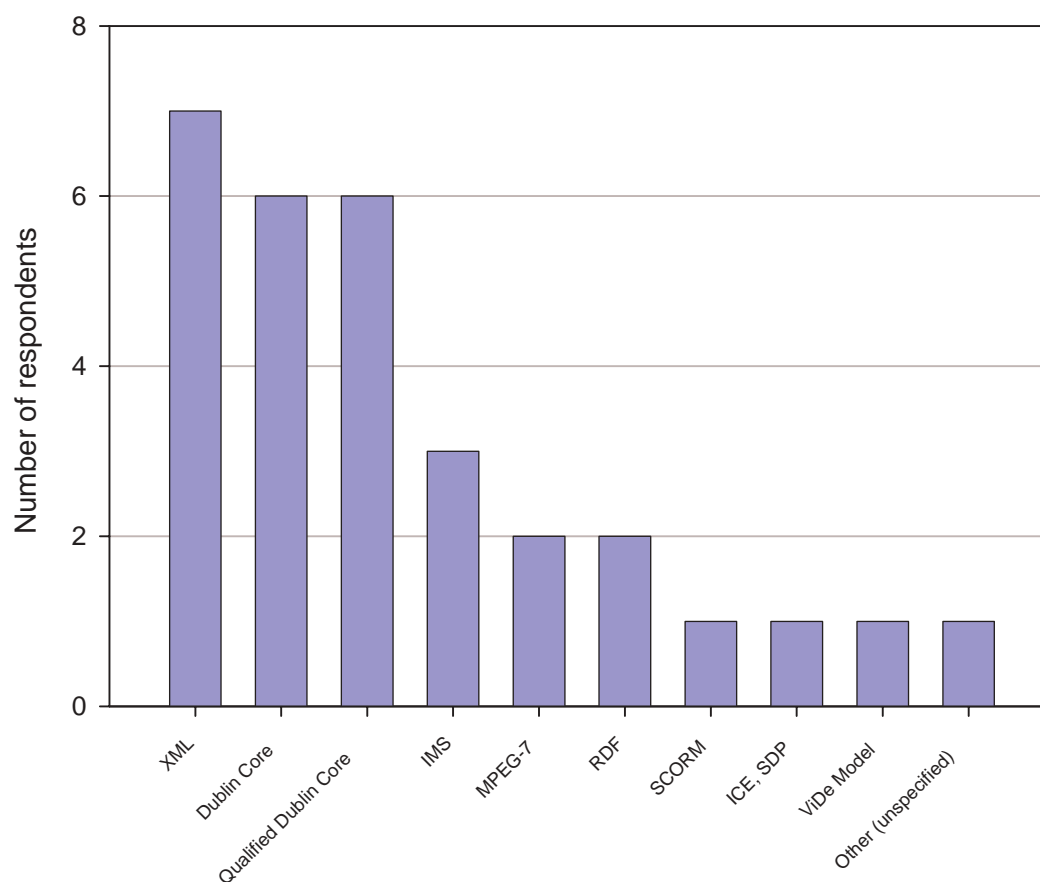
A quarter of the respondents report that they experience firewall problems and roughly the same fraction of respondents report that their organizations block UDP traffic. There is probably a great deal of overlap between these two questions since firewalls are most often the entities that block UDP traffic.

## 7. Metadata

30% of the respondents use metadata to describe their video assets and 21% of the respondents use metadata to describe their live streams. 57% of the metadata models are based on standards. The standards used are shown in the graph below.



Q106 What standard is the metadata model based on? (More than one item can be selected)



Some metadata examples were given as well.

#### Metadata examples

<http://www.ict holland.nl/videopoort/videopoort1.html>  
<http://www.surfnet.nl/innovatie/surfworks/svp/metadata.shtml>  
<http://tv.funet.fi/funet-tv/projekteja/medar2/index.jsp.en>  
<http://www.imsproject.org/>  
<http://www.adlnet.org/>  
<http://mod.carnet.hr/docs/radovi/terena/carnet-metamodel.html>

## 8. Future plans

74% of the respondents indicate that their organization has plans for significant changes in the near future for its video production and streaming environment (Q107) and 88% of those plan new streaming video projects (Q108).

The respondents' remarks about the future plans are summarized in the table below.

**Q110 Please provide more information about the new projects**

Have recently purchased Virage Webcast system and will be using that as the core for all streaming media projects, plus development of digital media library. In particular, plan major support for recording of classroom lectures and presentations for both distance learning and on-campus review.

Remotely controlled (via TCP/IP) cameras in lecture halls controlled from central location. Hardware MPEG-4 encoding.

We are actively seeking to move our streaming over to h.323/SIP for live events, so that there is only one network infrastructure to support for conferencing and streaming. We will **not** support proprietary streaming and the proprietary nature of the market is forcing us in this direction. We will be focusing on MPEG4 for archived media. Multicast will still be used for 7x24 channels such as CNN.

Cooperation with Finnish Virtual University (<http://www.virtaaliyliopisto.fi/>) project. Arrange and develop streaming activities on national level.

We are currently starting a pilot video portal. We are considering making an ENG kit for live streaming that institutions can borrow.

Distributed video encoding environment using Helix platform - Building of (semi-)professional video editing environment for production work.

Streaming of 4 TV news channels with multicast (MPEG-1), streaming of 4 radio music channels with multicast (MP3).

E-learning project with streaming and video on demand for courses. On-line streaming for courses and e-learning with faculty students.

New models of self-learning materials Streaming to mobile equipment.

Broadcasting the University Radio Station. Organization & Announcement of streaming content. Support of streaming video/audio combined with slide presentations.

We continue doing new procedures. We would like to use more sophisticated streaming servers and tag with meta-data. Also a central distribution server is wanted to ease our bandwidth demand when external users stream from us.

MPEG (2/4) platform, 3D streaming, metadata model, distributed transcoding.

Multicast to nomadic users, streaming to mobile devices, content management.

Moving streaming cart including workstations needed, cameras, microphones, lights, mixers, etc that is easy to move from one lecture room to another. Studio for streaming and photographic purposes.

We will provide a permanent live streaming channel.

Right now we are testing available products, preferably open source. Our plan is to make help desk support with SMIL presentations and to make lectures happen online.

We're going to project and build a "portable capturing station", to provide streaming in general purpose classrooms (not equipped).

Building a content distribution network for live sources.

Experimental P2P distribution of on-demand content. Higher-quality TV streams (MPEG-2, MPEG-4, fully digital production line).



International courses/education, through our own (new) server.

Specific courses in setting up web streaming servers and video content production for teachers. Upgrading our steaming services and will market them more actively.

The Virtual Campus (<http://cv.ehu.es/campus/>) of the UPV-EHU and our Research Group, Multimedia Group GM (<http://multimedia.ehu.es/>) established in the Fall of 2002 a formal relation of collaboration in the area of creation and transmission of multimedia content in high-quality video format. The two groups collaborate en the development of the VCCV project. This project was created with the main objective of creating the technological, administrative, and academic infrastructures for the integration in the CVplatform (e-elarning environment) of the UPV-EHU of teaching methods based on multimedia content with a high-quality video format. One concrete goal of the projectis the creation of 10 courses. These courses are scheduled to be offered during the academic year 2003/2004

SMIL streaming

IPv6 deployment

Deployment of windows media services

Two or more camera productions over live-stream. MPEG-4 production and streaming IPTV Streaming for handheld devices.

Multicast and IPv6 streaming, Kasenna implementation, iTV CMS, multimedia archive search, 'standalone' multimedia, digital rights management.

We plan to introduce new webcast digital cameras in our city and we plan to broadcast lectures by radio (ogg format).

Basically, offer more services with the infrastructure, such as events information and so.

We are installing two new windows media servers (server 9) for two new projects (VoD not public for the students of several universities). We are also installing new hardware MPEG-2 codecs (vbrick, and edje 2000) and a new hardware windows media codec (mgw2400).

A website dedicated to Streaming and make available this service to every institution connected through us. A VOD archive website. Best procedures in capture, processing and archiving.

We want to provide streaming services within our MAN Network. University lectures and seminars, sky projections from Planetarium, live festivals from the town.

Set-up a radio and television channel, produced by the students of the Communication Sciences School. Recording and live transmission of classes.

Student television.

I am working on an architecture proposal for European academic live streaming, so I hope that we will be able to accomplish this goal.

MPEG-4 Streaming for handheld devices.

Co-operation with libraries and national TV companies

Of the respondents who say they plan significant changes 72% say that there are new functionalities that they would like to see made available or developed (Q109).

An excerpt of the responses to which streaming functionalities the respondents would like to see developed is provided in the box below.



**Q111 Please provide more information about the new functionalities you would like to see**

We would like streaming to be more standardized and we focus as much as possible on standards based solutions such as ISMA. We would like to see and participate in a common European or global academic infrastructure for live streaming. Much depends on developments within metadata and also on the ability to code metadata information into stream segment information within delivery.

Simpler access to technology and storage

Automatically sync more than one source (audio/video+contents).

SMIL support in Windows Media Player, and other software playing and producing SMIL

We would like to see a "standard" slide synchronization methodology implemented for all streaming technologies. We would like to see live streaming in real time (there are promising technologies).

Seamless back-to-back streaming of segments of different streaming files (e.g. editing of streaming content). This is theoretically possible but practically impossible.

Mobile streaming experiences

We would like a standardized way to announce live streaming. We would like to be able to search in video repositories not just locally or nationally, but globally.

More integration within web scripting languages, it is currently vary basic meta stream commands, or through the use of yet another scripting language such as SMIL.

Realtime MPEG-4 encoding in hardware, multiple streams.

Accessibility issues are critical to our institution - need better captioning support, greater ease of player configuration. Streaming media works well for us in broadband applications, but <56k streams do not yet offer sufficient quality under most circumstances.

Strengthened interactivity, user control of participation and transmission.

We have made some development projects on media streaming, but it has not been followed-up by concrete projects. We do have some streaming servers behind our firewall for testing purposes, but it is not publicly available.

Streaming systems used together with videoconference systems, developed side by side for educational purposes

Streaming service for mobile devices and through wireless networks is a new challenge. We are currently working on it and would like to exchange experiences with anyone that might be interested in this.

Multiformat broadcasting for different network bandwidths. Users are not willing to install new mediaplayers, they do not know what their network speed is etc these information must be managed at the serverside. Multicasting is problematic.

Standardization problems. Multi-media problematics: Relation between production and transmission in various media, including broadcast TV and radio, DVD, etc.



## Summary and Conclusions

The TF-Netcast survey on streaming video was conducted on a very short notice and thus we did not reach as many potential respondents as we would have liked to. We used TERENA contact persons in each NREN as an entry point to help us identify respondents from each country, and the members of the task force was asked to invite individuals from their own country to answer the questionnaire. In addition to this we sent an open invitation to answer the questionnaire to mailing lists such as the TF-Stream mailing list. The geographical distribution clearly shows that this effort was not equally successful in every country and some European countries are completely missing (even a big country like France) while others such as Germany and the United Kingdom are relatively poorly represented in this survey. On the other hand there was 18 responses from Norway—a country with only 4.5 million inhabitants. Looking at the detailed responses however there does not seem to be any major geographical influence on how the questions were answered. Because of the way the questionnaire was propagated it is most likely to have reached advanced users of streaming media. It is therefore probably valid to assume that the respondents are representative of advanced streaming media professionals in academia as a whole.

The survey targeted several different types of people at the same time: content producers, streaming media specialists and metadata specialists as well as the generalist who does it all. We tried to address this multiplicity by building in conditions in the questionnaire ensuring that only relevant questions would be asked, but we realize that was sometimes a problem for a single person to answer all our questions since they related to the organization not to the respondent. In other cases we asked questions only to a small subgroup that could or should have been asked to more of the respondents. These shortcomings of the questionnaire were hard to predict and were not exposed when we tested the questionnaire. As long as we keep in mind which part of the respondents answered each question when we interpret the results this should not cause any problems.

The answers to the questions about content show that we did indeed reach the intended audience, *i.e.*, people responsible for content production and streaming in NRENs and their constituencies. The majority of the respondents came from universities and NRENs and the target audience was mainly from the same sector, *i.e.*, higher education staff and students. The content covers a wide range of different situations and topics and most organizations (88%) stream content themselves (Q18) while the rest probably rely on a third party (perhaps an NREN streaming service) to stream their content. A large fraction (81%) of those organizations that do stream themselves also offer live streaming (Q20). The size of the target audience covers a wide range (from 10 to 10 million), but the majority of respondents indicate an audience size in the range from 10 to 100,000 (Q9).

The answers to the questions relating to portals show that 40% of the organizations have a streaming portal of some sort (Q29). 58% of those who have a portal have further plans to announce videos to their users (Q30). Of those who do have a portal 74% also have a video archive (Q31) and 35% of the archives are searchable (Q32). These answers show that there is great interest in portals both for live streaming and for video-on-demand. The big interest in announcement of live streams shows that



there is a need for a service such as the TF-Netcast deliverable D: Prototype announcement portal. Since only 35% of the archives are searchable there seems to be a need for more information about using metadata for video-on-demand—a need which will be addressed by TF-Netcast deliverable G: Report on video-on-demand metadata and portal. The responses to the questionnaire also contained a large number of links to portals and archives that provide interesting examples of the kinds of portals that have been created.

The section about camera and production equipment in the questionnaire gives a good overview of what type of equipment is for recording, editing, and encoding content. Most organizations use DV and DVCAM equipment for recording, but other types of equipment is used as well. Adobe Premiere is the most popular video editing software followed by Avid, Pinnacle and Final Cut as well as a large number of less used video editing applications. For compression the most used tools are Windows Media Encoder, RealProducer, QuickTime Pro, and Cleaner.

The questions about streaming servers reveal which formats, servers and server platforms are in use and to what extent. 81% of the respondents say their organization operates one or more streaming servers (Q45) and this can be compared with the 88% who say their organization streams audiovisual content (Q18). The difference in the answers to these two questions may be due to incorrect answers or the fact that 7% of the organizations represented stream without using streaming servers. This could mean that they stream only multicast and hence do not need a server or that they consider progressive download as streaming. In any case the discrepancy is not large and is probably due to a mixture of the indicated reasons. Around one third of the represented organizations use MPEG-1 and MPEG-2 while MPEG-4 is used by 55%. Of the non-standard formats Windows Media is the most popular (used by 71%) followed by RealMedia (66%) and QuickTime (42%). The corresponding percentages of organizations that use the most popular streaming servers are as follows: Windows Media server (58%), QuickTime Streaming Server and/or Darwin streaming server (56%), RealServer (52%), and Kasenna MediaBase (10%). It is slightly surprising that 71% use Windows Media as a format while only 58% use Windows Media server. The same can be said for RealMedia (66%) and RealServer (52%). The most likely explanation is that the difference is due to the fact that some organizations make use of progressive download for some formats while streaming others but this is not an entirely satisfactory explanation and may point to an inconsistency in the provided answers. A detailed inspection of the answers also shows that some respondents do not distinguish between QuickTime Streaming Server and Darwin streaming server and for that reason those two servers have been combined into one category throughout this report. Kasenna MediaBase was reported in use by 10% of those organizations that operate streaming servers—a surprisingly large number that is probably due to the fact that this server streams the standards-based formats MPEG-1, MPEG-2 and MPEG-4. It is interesting to note that the operating system platforms on which the different servers are run show a preference for Unix and Linux where those are available options.

The respondents whose organizations run their own streaming servers were also asked whether they have deployed a content delivery network or replicate content between servers (Q80), and 8 respondents (13%) say they do. Of these 8 respondents 7 say that they are interested in joining a larger content distribution network (Q81) but only 4



are willing to let their own content distribution network be used for distributing events from other organizations (Q82). Based on these responses we may conclude that there is a big interest in participating in a larger content distribution network, but a reluctance to contribute resources. Perhaps this is because the conditions under which such participation is to take place were undefined. It is also worth noting that we only asked those respondents who already have their own content delivery network. It may be speculated that there is an equally large fraction of those who do not that would be interested in participating in a larger content delivery network. A content delivery network architecture is being studied and pilot tests are being carried out as part of TF-Netcast deliverable F: Report on live-streaming infrastructure.

The questions about media players give insights into which players are supported, used, and most popular. 50 respondents answered the questions about the media players. The answers show that Windows Media Player is used in 78% of the represented organizations, followed by RealPlayer (64%) and QuickTime Player (56%). The most popular player was also Windows Media Player preferred by 42% followed by RealPlayer preferred by 28% and QuickTime Player preferred by 16%. Almost a third (27%) use extra decoders—mainly to decode MPEG-2. All respondents except two (96%) support the Windows platform within their organization while 66% support Linux, 44% support MacOS and 42% support Unix. The conclusion is that although Windows Media is the dominant player and Windows is the dominant operating system platform the others are not far behind and we are truly dealing with a heterogeneous community where all common platforms are represented with a significant number of users. A lot of the comments made about the available media players deal with the fact that some players are not available on all platforms and that there is a lack of standardization and therefore a need to support more than one player.

A few questions were asked about the network infrastructure at the respondents' organizations. The answers to these questions show that most users (86%) have access through a fully switched network, that most networks support multicast and that around one quarter of the respondents have problems with firewalls and blocking of UDP traffic. Perhaps the greatest surprise is the widespread access to multicast, which means that more streaming could probably be done using multicast than is the case today. It would be interesting to see whether this conclusion holds in the wider academic community or whether we have reached a sub group with better multicast connectivity than that which is normally available.

All respondents were asked whether their video assets and live streams are described by metadata (Q102 and Q103) and 30% of the respondents answered that their asset are described by metadata while 21% said that their live streams are described by metadata. The respondents who answered yes to either or both of these questions were subsequently asked further questions about their use of metadata. Eleven respondents (41%) said that their metadata model was available and six of those provided a link to a description of the model. 59% of the metadata models are based on standards and among the standards used in the metadata models are: XML, Dublin Core, Qualified Dublin Core, IMS, MPEG-7 and RDF. A significant fraction of the respondents use metadata but this number is expected to rise as the number of assets and thus the need to be able to search increases. Those who do not yet use metadata may benefit from TF-Netcast deliverable G: Report on video-on-demand metadata and portal.



Finally the respondents were asked about their future plans and most respondents indicated that they had plans for significant changes in the near future and were also planning new streaming video projects. This shows that we are dealing with an active community and a changing technology. The respondents provided input about their future projects and also made comments about new functionalities that they would like to see developed or made available. These responses have been summarized earlier. Many of the wishes for future developments relate to a better adherence to standards.



## **Appendix A TF-Netcast Questionnaire Summary**

In this appendix the full questions in the questionnaire are reproduced. The possible answers have only been reproduced in cases where they influence the branching of the questionnaire, *i.e.*, when a certain answer enables another set of questions. The questions are divided into pages, and only one page was presented to the user at a time in the users' web browser, and the questions are presented below in the order in which they were presented to the respondents.

### **TF-Netcast Questionnaire**

#### **Page 1**

TERENA (Trans-European Research and Education Networking Association) carries out technical activities and provides a platform for discussion to encourage the development of a high-quality computer networking infrastructure for the European research community.

The TF-Netcast Task Force is established under the auspices of the TERENA Technical Programme to prepare the creation of a portal for live-streaming announcements and to investigate the possible extension of the portal to an academic channel for live-streams and video-on-demand.

With this survey, the TF-Netcast Task Force tries to get a better understanding of the way streaming video is used within its community and the direction in which this technology is developing. The results of this survey will be made publicly available and shall be applied to future projects by the TF-Netcast group as well as its members.

The estimated time for filling in the questionnaire is 20-30 minutes.

#### **Page 2**

**Q1** Name

**Q2** E-mail

**Q3** Organization name

**Q4** Department

**Q5** Type of organization

#### **Page 3**

**Q6** Country:

**Q7** Approximate number of people that work at your organization

**Q8** Please characterize the target audience to whom you offer streaming content.

**Q9** What is the approximate size of your target audience?

#### **Page 4**

Who are the contact persons for the streaming activities and content production within your organization? (This information will not be made publicly available, and will not be included in the results of this questionnaire. It is solely for internal use within the TF-Netcast task force).

**Q10** Name



**Q11** Email

**Q12** Name

**Q13** Email

**Q14** Name

**Q15** Email

**Q16** What kind of support does your organization offer regarding the use of the streaming services? (More than one item can be selected)

**Q17** If possible, please give examples of streaming/video productions and / or projects from your organization. Please provide hyperlinks that point to the content.

**Page 5**

**Q18** Does your organization stream audiovisual content?

Yes

[Enables](#)

[Page 6](#)

[Page 8](#)

[Page 9](#)

No

[Enables](#)

[Page 9](#)

**Page 6**

**Q19** What sort of material is streamed by your organization? (More than one item can be selected)

**Q20** Does your organization offer live broadcasting?

Yes

[Enables](#)

[Page 7](#)

No

Don't know

**Page 7**

**Q21** How often do you stream live content?

**Page 8**

What languages are used in your streaming material?

**Q22** Primary language(s)

**Q23** Secondary language(s)

**Q24** Other languages

**Q25** Please characterize the users that produce their own content within your organization

**Q26** What are, apart from streaming, the typical distribution media used for getting the content to the end users?

**Q27** Does your organization, besides video and audio, also offer other streaming media elements?

**Q28** Does your organization collaborate with the private sector?



**Page 9**

**Q29** Does your organization have a streaming portal or streaming announce portal?

No  
Enables

[Page 13](#)

Yes, it is available at (hyperlink)

Enables

[Page 10](#)

[Page 13](#)

[Page 12](#)

**Page 10**

**Q30** Does your organization have any (further) plans for announcing videos to the end-users?

**Q31** Does your organization have a video archive?

No

Yes, it is available at (hyperlink)

Enables

[Page 11](#)

**Page 11**

**Q32** Is the audio and video archive searchable?

**Page 12**

**Q33** Are other archives searchable/reachable through your portal?

**Q34** Are the streaming files available to all users, or can they only be accessed by a specific user group? (More than one item can be selected)

**Q35** Please provide more information about the special end user policies. Who is allowed to use the streaming portal (search, upload, stream)?

**Page 13**

**Q36** Does your organization record and/or edit content for streaming?

Yes  
Enables

[Page 14](#)

No

**Page 14**

**Q37** What kind of camera and audio equipment are used within your organization? (More than one item can be selected)

**Q38** What kind of video editing equipment is used? (More than one item can be selected)

**Q39** What is the number of staff available for producing content?

**Page 15**

**Q40** Does your organization encode material for streaming?

Yes  
Enables

[Page 16](#)

No

**Page 16**

**Q41** What software or hardware encoding tools are used within your organization? (More than one item can be selected)

**Q42** General comments and suggestions about the used tools.

**Q43** What types of streaming formats are used within your organization? (More than one item can be selected)

**Q44** What is the recommended streaming format (filetype, pixelsize, framerate, etc.)?



If there are several scenarios that are often used, please describe the settings for all the scenarios.

**Page 17**

**Q45** Does your organization operate any streaming servers?

Yes

Enables

Page 18

Page 31

Page 35

Page 36

No

Enables

Page 36

**Page 18**

**Q46** Which of the following servers do you use? (More than one item can be selected)

Cisco IP/TV server

Enables

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Darwin streaming server

Enables

Page 20

IBM VideoCharger

Enables

Page 21

Kasenna MediaBase

Enables

Page 22

nCUBE

Enables

Page 23

RealServer

Enables

Page 24

VBrick streaming server

Enables

Page 25

Windows Media server

Enables

Page 26

QuickTime Streaming Server

Enables

Page 27

Other streaming software

Enables

Page 28

**Page 19**

Cisco IP/TV server

**Q47** Which file types do you stream with these applications?

**Q48** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 20**

Darwin streaming server

**Q49** Which file types do you stream with these applications?

**Q50** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 21**

IBM VideoCharger

**Q51** Which file types do you stream with these applications?



**Q52** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 22**

Kasenna MediaBase

**Q53** Which file types do you stream with these applications?

**Q54** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 23**

nCUBE

**Q55** Which file types do you stream with these applications?

**Q56** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 24**

RealServer

**Q57** Which file types do you stream with these applications?

**Q58** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 25**

Vbrick streaming server

**Q59** Which file types do you stream with these applications?

**Q60** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 26**

Windows Media server

**Q61** Which file types do you stream with these applications?

**Q62** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 27**

QuickTime Streaming Server

**Q63** Which file types do you stream with these applications?

**Q64** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Page 28**

Other streaming software

**Q65** Name of streaming software

**Q66** Which file types do you stream with these applications?



**Q67** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Q68** Do you have any other non-mentioned streaming software?

Yes

[Enables](#)

[Page 29](#)

No

#### Page 29

Other streaming software

**Q69** Name of streaming software

**Q70** Which file types do you stream with these applications?

**Q71** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

**Q72** Do you have any other non-mentioned streaming software?

Yes

[Enables](#)

[Page 30](#)

No

#### Page 30

Other streaming software

**Q73** Name of streaming software

**Q74** Which file types do you stream with these applications?

**Q75** On which of the following operating systems do you run the streaming servers? (More than one item can be selected)

#### Page 31

**Q76** How many hardware servers (machines) are used within your organization?

**Q77** To what extent is the equipment used (how many hours/month)?

**Q78** Have you ever reached your maximum concurrent streams license?

**Q79** Are the video files also distributed as flat files or in any other way within your content delivery network?

**Q80** Does your organization deploy a Content Distribution Network, or any other form of content replication between the servers? (if yes, please provide a short description about the manufacturer, protocol and media formats used)

No

[Enables](#)

[Page 35](#)

Yes

[Enables](#)

[Page 32](#)

[Page 35](#)

#### Page 32

**Q81** Are you interested in joining a larger Content Distribution Network?

Yes

[Enables](#)

[Page 33](#)

[Page 35](#)

No

[Enables](#)



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**Page 33**

**Q82** Would you like to participate in activities where your Content Distribution Network is used for distributing events from other organizations?

Yes

[Enables](#)

[Page 34](#)

No

**Page 34**

**Q83** When sharing your Content Distribution Network, do you prefer a common framework, or do you prefer to leave the adaptation layers outside from your Content Distribution Network?

**Page 35**

**Q84** Is any kind of load balancing used?

**Q85** How is the maintenance of the streaming servers taken care of? (More than one item can be selected)

**Q86** What is the size of the technical team (system administrators, technical streaming specialists)?

**Page 36**

**Q87** Does your organization support and/or recommend the use of specific streaming media players?

Yes

[Enables](#)

[Page 37](#)

[Page 39](#)

[Page 40](#)

No

[Enables](#)

[Page 40](#)

**Page 37**

**Q88** What media player software do you use on the computers within your organization? (More than one item can be selected)

**Q89** What is your preferred player / favorite player?

**Q90** Do you use extra decoders (e.g. software MPEG-2 decoder)?

**Q91** Does your organization provide a default installation on the users' PCs?

Yes

[Enables](#)

[Page 38](#)

No

**Page 38**

**Q92** What media players are installed as default on the users PCs within your organization? (More than one item can be selected)

**Page 39**

**Q93** How are the media players typically updated on the user PCs? (More than one item can be selected)

**Q94** What platforms are supported within your organization? (More than one item can be selected)

**Q95** Any special comments about the media players?

**Page 40**

**Q96** Is your organization responsible for operating a network infrastructure used for streaming, or do you use such an infrastructure and are you able to provide information about it?

Yes

Enables

[Page 41](#)

No

**Page 41**

**Q97** Does your organization have a switched network infrastructure, i.e, a network without any shared media such as ethernet hubs and coaxial wiring?

**Q98** Do you experience firewall problems?

**Q99** Does your organization block UDP traffic?

**Q100** Does the backbone of your local network support multicast?

**Q101** Does the local area network support multicast?

**Page 42**

**Q102** Are the video assets that your organization uses, described by metadata?

Yes

Enables

[Page 43](#)

[Page 45](#)

No

Enables

[Page 45](#)

**Q103** Are the live streaming channels or events described by metadata?

Yes

Enables

[Page 43](#)

[Page 45](#)

No

Enables

[Page 45](#)

We don't offer live streaming

Enables

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**Page 43**

**Q104** Is the metadata model (data structure) available?

**Q105** Is the metadata model based on a standard?

No

Yes

Enables

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**Page 44**

**Q106** What standard is the metadata model based on? (More than one item can be selected)

**Page 45**

**Q107** Does your organization plan any significant changes in the near future for its video production and streaming environment?

Yes

Enables

[Page 46](#)

[Page 49](#)

No

Enables

[Page 49](#)



**Page 46**

**Q108** Does your organization plan any new projects in video streaming?

Yes

[Enables](#)

[Page 47](#)

No

**Q109** Are there any new functionalities you would like to see made available or developed regarding streaming video?

Yes

[Enables](#)

[Page 48](#)

No

**Page 47**

**Q110** Please provide more information about the new projects

**Page 48**

**Q111** Please provide more information about the new functionalities you would like to see

**Page 49**

**Q112** Did we forget to ask you something important? Please provide us with all information you think is important here.