CHAPTER 4

FROM BROADCASTING TO WEBCASTING:
INTELLECTUAL PROPERTY PROTECTION
IN THE ERA OF CONVERGENCE
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Broadcasting that emerged as radio broadcasting in the first decade of the 20th century has evolved considerably as a result of the development of transmission technology and receiving equipment. New ways of distributing services have been created as well as new types of programs and services, including some with a more or less developed interactive element. New copying techniques and equipment have also been developed allowing for a significantly better quality of copies, both for private use and commercial purposes. This has affected the nature of broadcasting, in particular as regards those broadcasting services that include an interactive component. Also, new types of providers offering services or programs have emerged.

As traditional broadcasting has developed a number of other services, a number of new players have become involved in the transmission of both traditional
broadcasts and, in particular, of new types of services and programs. In terms of size and character the traditional and new are very different, spanning from large national broadcasting corporations operating under well-defined rules to private individuals operating in the absence of rules.

The impact of digital and information technologies on broadcasting is manifold. Digital and information technologies can carry both broadcasting and telecommunications services on the same network. Together they have ushered in an era known as convergence, that is, the merging and integration of two or more technologies and their related services. The combination of digital television, computers and telecommunications is an example of convergence, first of different technologies, and secondly of the services offered. The capacity of transmission has vastly increased and the quality of sounds and images has improved dramatically. The Internet, or other similar digital networks such as those based on wireless applications, are becoming another way of distributing copyright protected content, for example through webcasting. Webcasting is the real-time transmission to the public in a digital format of audio and audiovisual works. Webcasting over the Internet is similar to broadcasting but uses special technology to reduce the size of the digital files being sent. Webcasts are widely available to anyone with a computer connected to the Internet. Webcasting opens new opportunities for authors and performers to expose and market their works to new audiences, and for the public to enrich their understanding and appreciation of cultures from around the world.

The world of broadcasting, as we have known it, is about to change with the leading broadcasting organisations ready to jump on the Internet bandwagon. Webcasting has a promise of presenting content which fits the slogan of ‘anything, anytime, anywhere’. In view of the growing importance and widening reach of webcasting and increasing incidents of piracy involving webcasting, it has become extremely important for national laws and international conventions
to address this phenomenon which till now has been ignored. In this light this chapter examines the issues of:

- how the world of broadcasting is undergoing changes with the emergence of the digital and information technologies?
- should Internet broadcasting/webcasting be accorded legal protection and if yes, how?

THE IMPACT OF DIGITAL TRANSMISSION TECHNOLOGIES ON BROADCASTING: FROM BROADCASTING TO WEBCASTING

Broadcasting

Broadcasting emerged as radio broadcasting in the first decade of the 20th century and internationally television broadcasting became widespread after 1960s. Since then it underwent important changes as regards the production, dissemination and consumption of programmes. Still, in the 1960s broadcasting was technically limited to analog\(^1\) radio and television services provided over the air from terrestrial transmitters, and due to spectrum\(^2\) constraints, the number of

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\(^1\) In telecommunications, an analog signal is one in which a base carrier's alternating current frequency is modified in some way, such as by amplifying the strength of the signal or varying the frequency, in order to add information to the signal. Broadcast and telephone transmission have conventionally used analog technology. An analog signal can be represented as a series of sine waves. The term originated because the modulation of the carrier wave is analogous to the fluctuations of the human voice or other sound that is being transmitted.

\(^2\) Spectrum or ‘electromagnetic radiation spectrum’ is the complete range of the wavelengths of electromagnetic radiation, beginning with the longest radio waves (including those in the audio range) and extending through visible light (a very small part of the spectrum) all the way to the extremely short gamma rays that are a product of radioactive atoms. Electromagnetic radiation results from the physics of the electromagnetic field. (http://whatis.techtarget.com/definition/0,,sid9_gci212045,00.html).
channels was limited. What might be considered the main features of broadcasting have since then to some extent remained unchanged? The main operation that is performed by a broadcasting service consists in sending a stream of signals containing images and/or sounds for reception by the public at large. Broadcasting is not confronted with any inherent limitation as to the number of receivers within a given geographical area covered by the radio waves concerned. One transmitter can reach an audience of 2,000 or 2,000,000 for almost the same technical costs. The marginal cost to the broadcasting organization of extra listeners or viewers is effectively zero.

Under the International Telecommunications Union (ITU) Radio Regulations a “broadcasting service” is defined as a service in which the transmissions via Hertzian waves (i.e., electromagnetic waves of frequencies propagated in space without artificial guide) are intended for direct reception by the general public. The Radio Regulations apply to both sound radio and television.

Broadcasting is sometimes referred to as a “point-to-multipoint” technology which means it is a process in which the same signal flows, or is transferred, from a single origin to multiple consumers. That signal should arrive at all the endpoints at roughly the same time. In this case the network links always end at a number of different points. A description of the point to multipoint is provided in figure 4.13 below.

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1 WIPO document No. SCCR/7/8 at p. 21 (April, 2002).
The broadcasting market is today essentially composed of two main categories of operators. The first one consists of broadcasting organizations that finance their activities through advertising or license fees. Their broadcasting is usually non-encrypted. The other model consists of television by subscription, essentially pay television companies. The two main features of pay-TV relate to the controlled access to the program and the payment of the subscriber. The success of the major pay-TV channels has been founded on their exclusive licensing, on a geographical basis and for a limited period of time, of the rights in certain programs. The major part of these programs is made of films, news, and sports coverage which provide high audience figures. Sports, in particular, is a sector where there is often only one exclusive licensee for each country.4

4 WIPO document No. SCCR/7/8 at p. 4 (April, 2002), Para. 9.
Emergence of Webcasting

The impact of digital and information technologies on broadcasting is manifold. First, digital and information technologies can carry both broadcasting and telecommunications services on the same network. Together they have ushered in an era known as convergence, that is, the merging and integration of two or more technologies and their related services. The combination of digital television, computers and telecommunications is an example of convergence, first of different technologies, and secondly of the services offered. In that way, digital and information technologies have brought about new transmission techniques, new forms of presenting and distributing television and radio broadcasts.

Figure 4.2 below graphically represents the convergence. On the one hand we are able to receive traditional broadcasting on our computers and cell phones in addition of television sets, on the other hand we are able to access Internet on our television and cell phone in addition of computers. Along with this we are able to receive broadcasting through the Internet.

5 As opposed to analog, digital describes electronic technology that generates, stores, and processes data in terms of two states: positive and non-positive. Positive is expressed or represented by the number 1 and non-positive by the number 0. Thus, data transmitted or stored with digital technology is expressed as a string of 0’s and 1’s. Each of these state digits is referred to as a bit (and a string of bits that a computer can address individually as a group is a byte). Prior to digital technology, electronic transmission was limited to analog technology, which conveys data as electronic signals of varying frequency or amplitude that are added to carrier waves of a given frequency. Broadcast and phone transmission has conventionally used analog technology. Digital technology is primarily used with new physical communications media, such as satellite and fiber optic transmission. A modem is used to convert the digital information in your computer to analog signals for your phone line and to convert analog phone signals to digital information for your computer. (http://whatis.techtarget.com/definition/0,,sid9_gci211948,00.html).
Second, the capacity of transmission has vastly increased and the quality of sounds and images has improved dramatically. Third, digital technology has allowed for the creation and distribution of new kinds of services. This is for instance the case of multi-channel TV, which implies a greater choice of programs, such as “video-on-demand”\(^6\) services. Some of the new services imply a combination of interactive\(^7\) and broadcast elements. In any case, the

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\(^6\) Video on Demand (VOD) services produced by broadcasting organizations enable users to select a video program, typically a film, and have it sent to them via a cable or satellite connection, either for direct viewing or the film may be stored in the users’ hard disks in the television sets and watched later. In the latter case, the viewer can pause, fast forward, fast rewind, slow down, etc, as if the film were running on a video cassette recorder. Other interactive features may include the ability to avoid or select advertisements or to investigate additional details about news events. This is also known as interactive VOD. Another type of VOD is the delivery of content over a network in real time to a set top box.

\(^7\) “Interactive services” refer to a particular kind of television or radio services which include an interactive element, that can be distributed either on digital or analog networks. “Interactive” normally means that there is a return path between the viewer and the broadcasting organization.
user has a greater degree of choice and decision, for example, regarding the timing and the language of the program, as well as of the program itself.

Fourth, the Internet, or other similar digital networks such as those based on wireless applications, are becoming another way of distributing copyright protected content, for example through webcasting\(^8\). There is no established legal definition of webcasting or of a webcaster, and the term may be understood as applying to any type of a number of different kinds of transmission services over the Internet which might have varying degrees of interactivity and pre-programming of the content.

As depicted in figure 4.3, from a technical perspective, there are two principal methods for users to access sound and images (or a combination of both) over the Internet. The first are downloads, whereby a file on a server is accessed by a remote user, transmitted over the Internet in the form of “packets” to the user’s machine and saved there locally (in most cases on the hard drive)\(^9\). The second is streaming, which has been defined as an “Internet data transfer technique that allows users to see and hear audio and video files without lengthy download times. The host or source ‘streams’ small packets of information over the Internet to the user, who can access the content as it is received. The stream may be a real time (live) [transmission] or it may be an archived file.”\(^10\) The

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In other words, the program is broadcast to the public at large, and the viewer will have the possibility to make an individual request to the broadcasting organization over the return path (back channel), for example, over the telephone (whether vocally or by pressing a pre-set number/dialing code) or through a Internet link. That latter operation over the back channel is not broadcasting, but point to point transmission. This means that there is a connection only between one person or entity and another. Described in very general terms, interactive television is television with added content and enhancements which can be selected by the viewer.

\(^8\) The practice of webcasting is also described as netcasting or Internet broadcasting or streaming.

\(^9\) This form has already been dealt with in the previous chapter on peer to peer networks.

common underlying feature of all different types of streaming, which distinguishes this method of transmission from downloads, is that, in the case of streaming, files are not saved locally on the user's machine. Figure 4.3 below shows how webcasting takes place on the Internet.

Webcasting is the real-time transmission to the public in a digital format of audio and audiovisual works. Real-time transmission of audio and audiovisual works became possible in mid-1995, with the introduction by a company known as
Progressive Networks, Inc. (now RealNetworks, Inc.) of the RealPlayer software for real-time transmission or "streaming" of audio transmissions.

Webcasting is seen as a new model of content delivery on the Internet providing automated and, possibly, personalized delivery of services. Access to the Internet is based on telecommunications networks; that means it is possible to have Internet connectivity both by wire and wireless means. In case of webcasting of audio, video and animation the user receives the content when it is transmitted, but without retaining a copy of it. Webcasting services function on the basis of “pull technology,” which means that the content is delivered to the user upon request.

As depicted in figure 4.3, webcasting could further be divided into (i) on-demand service (ii) real-time streaming. On-demand service refers to that webcasting which can be activated by an individual used at his place and at a time individually chosen by him. Whereas in case of real-time streaming content is streamed at a time chosen by the webcaster; any one who is interested in listening/viewing may log on to the server of the webcaster at that time. The difference between the two lies in that in case of on-demand service users have the choice to log on any time which in real-time streaming users have to log on at a time chosen by the webcaster and content can be perceived only at the time when it is transmitted.

Internet services may be accessible via different kinds of receiving equipment. Both television sets or computers may be set up as receivers for different kinds of services. Indeed, in the future a person at home may have merely a display screen, for which modules will provide the various connections necessary for the different services required whether from broadcasting organizations or webcasters. The content originates from one or more servers that make it accessible via the Internet. Each recipient requests the program from the initial
server and is issued a separate stream from the source to his or her address as depicted in figure 4.4 below.

Physical means of webcast transmission may be by either wired or wireless means. Internet access has generally been offered by wire, through telephone lines and more recently through cable modems. However, system operators also offer Internet access by wireless means such as satellite, cellular telephone, and microwave distribution systems.

Another scenario that might develop in the future is the involvement of a multitude of servers in order to reduce the distance between the source and the recipient. This may either be managed by the sender or by the network infrastructure through a process called “multicasting,” where Internet routers
receive signal streams and then serve them individually to one or more recipients. Though the signal has to be sent from the initial source to the multitude of intermediate servers or routers it will not generally be present, but be issued from a source only upon individual demand. Once demanded, the transmission occurs in a one-to-one communication channel to the specific IP address, but from an intermediary source rather than the originator. As the user terminates his demand, the provider (or intermediate server) stops the transmission.\textsuperscript{11}

In this respect, webcasting is a "point-to-point" technical process. Even though the same program is transmitted to multiple recipients, it is transmitted via a point-to-point bi-directional communication, instigated by the user. In other words, there is an individual virtual connection per user, over which parallel point to point streaming to each of the individual subscribers take place. In other words, there is an individual connection between each user and the source of the streamed content (a host) and such point to point streaming to multiple individual users takes place in parallel.

Delivery of Audio and Video over the Internet has been made possible by recent advances in technology. It is now possible to view events as they are happening in 'real-time' on an ordinary personal computer by the use of webcasts. Webcasting over the Internet is similar to broadcasting but uses special technology to reduce the size of the digital files being sent. There is also the potential to reach a much wider audience than with a normal TV channel - Last year 350 million people down-loaded Video Players -- the largest video audience in the world. (Media Player, RealPlayer and QuickTime enable people to view streamed videos and are available free on the net).\textsuperscript{12}

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\item[11] WIPO document No. SCCR/7/8 at p. 4 (April, 2002), Para. 49.
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Webcasts are widely available to anyone with a computer connected to the Internet. The only investment required specifically to receive Internet broadcasts is to acquire a sound card and speakers, which commonly are standard equipment delivered with any personal computer purchase. Software that enables reception of these broadcasts commonly are bundled into Internet browsing software such as Netscape Communicator, Microsoft Internet Explorer or the Opera browser; and software specifically designed to receive such audio and video streams generally are available for downloading without charge from companies such as RealNetworks, Inc. As a result, it is estimated that more than 50 million people have acquired free software from RealNetworks, Microsoft Corp. and others that enable reception of real-time audio and video over the Internet. RealNetworks estimates that each week, more than 145,000 hours of live sports, news, music and entertainment are broadcast live over the Internet using their software technology, in addition to hundreds of thousands of hours of programming available on-demand.13

Works broadcast over the Internet may appear in conjunction with on-screen text and graphics. The audio or audiovisual broadcast data comprise streams that generally are separable from the data that appear as text and graphics on-screen; when viewed together, the user is provided with a rich multimedia experience heretofore unavailable through traditional broadcast media. These text and graphics may provide additional information concerning the broadcast material, and may incorporate hypertext links from which the listener or viewer can access additional information concerning the events or works being broadcast, or can be linked to e-commerce Web sites where the listener or viewer can learn about and purchase of goods and services related to the broadcast (e.g., compact discs of music, CD-ROMs of software programs, videocassettes or DVDs, concert tickets, etc.).

Webcasting replicates and expands upon the forms of broadcasting available by more traditional terrestrial, cable or satellite forms of broadcasting. Typical Internet radio\textsuperscript{14} stations may be analogous to terrestrial broadcast programming, featuring announcers, news, information and music programming. Internet radio\textsuperscript{15} may include produced or archived programming.

A number of Internet broadcasters retransmit the signals of radio stations.\textsuperscript{16} Radio stations also retransmit their own signals via webcasting.\textsuperscript{17} This retransmission is referred to as simulcasting which means the process of disseminating the same broadcast over two different transmission systems, for example, when the sound of a TV program is also played over a radio station. The term is also used for the simultaneous broadcasting and streaming over the Internet of a broadcast. Broadcasting organizations often simulcast their broadcast program services via both analog and digital systems.

\textsuperscript{14} Examples of these broadcast types may be found at Virgin Radio in the United Kingdom, http://www.virginradio.com/ Eclectic Radio Corporation at http://www.gogaga.com/ or Zero24-7 at http://www.zero24-7.org/.

\textsuperscript{15} Examples of this include the World Radio Network at http://www.wrn.org/ondemand presenting listeners with international public radio programming from more than a dozen countries from Europe to Australia and New Zealand.

\textsuperscript{16} The largest of these is broadcast.com, at http://www.broadcast.com/ which transmits over the Internet the signals of more than 400 radio stations and 40 television stations and networks. QRadio, at http://www.qradio.com/ is a website created by the well-known musician, arranger, composer and producer Quincy Jones, which focuses on exposing world music to a global audience, and retransmits radio stations from South Africa, Brazil, Croatia and the Czech Republic.

Some webcasts program uninterrupted channels of music, providing hypertext links to sites with information relating to the broadcast. These audio channels generally identify the music being played in a text box, including the name of the artist, song title and album title. Such channels also may provide hypertext links to Internet retailers from which the recording being performed may be purchased. Others create original programming available only via the Internet, such as the British comedy audio program, “Giant Steps”.

One of the most comprehensive Internet audio guides, the SonicNet Music Guide at http://www.sonicnet.com/home/index.jhtml, lists more than 900 websites that deliver audio broadcasting to the public. Of these, approximately 230 sites are Internet-only channels; that is, channels that are created solely for broadcasting over the Internet. The remaining sites retransmit radio station transmissions, with approximately 160 of these station retransmissions originating outside of the United States.

Although bandwidth constraints have extremely limited the transmission of video on the Internet, several companies, including Xing Technology, VDOnet,...

19 Available at: http://www.giantsteps.co.uk/.
20 Bandwidth has a general meaning of how much information can be carried in a given time period (usually a second) over a wired or wireless communications link. For example, a link with a broad bandwidth - that is, a broadband link - is one that may be able to carry enough information to sustain the succession of images in a video presentation. More technically, bandwidth is the width of the range of frequencies that an electronic signal occupies on a given transmission medium. Any digital or analog signal has a bandwidth. In digital systems, bandwidth is expressed as bits (of data) per second (bps). Thus, a modem that works at 57,600 bps has twice the bandwidth of a modem that works at 28,800 bps. In analog systems, bandwidth is expressed in terms of the difference between the highest-frequency signal component and the lowest-frequency signal component. Frequency is measured in the number of cycles of change per second, or hertz. A typical voice signal has a bandwidth of approximately three kilohertz (3 kHz);
and VXtreme in Palo Alto, California, are pushing technologies that compress sound and images into viewable—though rather jerky—transmissions across narrowband phone connections. Anticipating that the Internet may be an enormous new market for video content in a higher-bandwidth future, some broadcasters want to get in on the ground floor. As deployments of cable modems and Digital Subscriber Line (DSL) services continue to increase throughout the world, Video-on-Demand (VOD) services over Internet Protocol (IP) networks will grow to a total of more than 17 million users, generating over $1.9 billion (US) in subscription and pay-per-view revenue during 2006, according to In-Stat/MDR. The high-tech market research firm reports, that as consumer-oriented VOD services over IP become more pervasive, revenue generated by family-oriented VOD services will eventually surpass those of adult content sites, which currently dominate the VOD-over-IP market. “Several million movie streams per month are currently being served up for free, but as the major movie studios enter the fray, with premium movie titles, pay-per-view and subscription services will gain traction, helping Hollywood figure out what the market is for ‘on demand’ content, and help engineers and software programmers to develop efficient delivery systems and workable Digital Rights Management solutions”.

By the end of 2004, the number of subscribers and pay-per-view participants, regularly using family oriented “on demand” IP services, will out number the users of adult content services, and, by 2006, family oriented “on demand” services will overtake the adult content sites in terms of annual revenues. As broadband applications begin to migrate up and down the bandwidth continuum,

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an analog television (TV) broadcast video signal has a bandwidth of six megahertz (6 MHz) -- some 2,000 times as wide as the voice signal. It should be remembered that a real communications path usually consists of a succession of links, each with its own bandwidth. If one of these is much slower than the rest, it is said to be a bandwidth bottleneck.

(http://searchnetworking.techtarget.com/sDefinition/0,,sid7_gci211634,00.html).

21 http://www.usvo.com/history/instatmdr.html# Present and Future by In-Stat/MDR.
the dividing lines between television stations, Cable TV headends and corporate streaming media networks will blur, according to new research from In-Stat/MDR.\textsuperscript{22} As this occurs, new players with innovative products may quickly out-distance long-established companies who fail to see the walls of their vertical markets coming down. Digital content is slowly covering the entire world.\textsuperscript{23}

Webcasting opens new opportunities for authors and performers to expose and market their works to new audiences, and for the public to enrich their understanding and appreciation of cultures from around the world. Rather than creating a homogenization of experience, webcasting emphasizes the importance of local culture. An Internet channel from India, Nigeria, USA or Australia, for example, will attract listeners from around the world primarily because it provides a window to local information, news, customs and arts. Thus, webcasting is a source for information, culture and commerce of all nations and cultures in a way that transcends the normal physical limitations of terrestrial communications, or the channel bandwidth restrictions of satellite broadcasting.

Importantly, webcasting unleashes new opportunities for artists and performers to market their works on a global basis. A common feature offered by webcasters is a “buy” button or link, such that the consumer who hears music or watches a music video, for example, may be transported to a retail Web site that offers for sale the works being broadcast. Currently, such sales predominantly are being made through mail delivery of physical product to the consumer. Over

\textsuperscript{22} http://www.usvo.com/history/instatmdr.html# Present and Future by In-Stat/MDR.

\textsuperscript{23} The latest findings from Jupiter Research, a division of Jupitermedia Corporation (Nasdaq: JUPM), reveal that Subscription Video On Demand (SVoD) will drive profits and attract customers to new digital premium services. According to Jupiter Research’s latest report, "The Impact of On-Demand Content on Cable Revenues in the U.S.", the Video On Demand (VoD) market will grow from $293 million in 2003 to $1.4 billion in 2007, and that of SVoD will top $800 million, up from $56 million in 2003. Collectively, this market will grow 58% annually, from $349 million in 2003 to $2.2 billion in 2007.
the next few years, with improvements in bandwidth\textsuperscript{24} and connection speed, deliveries of purchased works can occur by digital transmission to the consumer.

The world of broadcasting, as we have known it, is about to change with the leading broadcasting organisations ready to jump on the Internet bandwagon. Webcasting has a promise of presenting content which fits the slogan of ‘anything, anytime, anywhere’. In view of the growing importance and widening reach of webcasting it has become extremely important for national laws and international conventions to address this phenomenon which till now has been ignored.

**Difference between broadcasting and webcasting**

In the case of broadcasting, users can simply access the broadcast by switching on the receiver as the signal transmitted by the broadcasting station is direct and present, whereas, in webcasting, users must access a server and incite its facilities to transmit back the information.

Unless specific technological restrictions are applied, webcasts can be accessed from any point that has Internet access. Since Internet is available globally, webcasts can be accessed from almost any point on the planet earth. This is the major difference in term of geographical coverage from broadcasts, be it via satellite, cable or over the air which have an inherent limitation in their reach.

On the Internet, there are no restrictions on the number of programs offered. The Internet offers an abundance of bandwidth, protocols and domains, which are constantly augmented to adapt to growing demand. Capacity can be obtained at relatively short notice and allows for a flexible adaptation to the level of demand. Consequently, the initiators of streams face no significant initial

\textsuperscript{24} Supra note 20.
barrier to entering the market. Webcasting activities can be initiated with modest investments, albeit with a limited capacity of simultaneous listeners or viewers. Streaming services can be adapted to the consumers’ preferences, for example, distributing niche programs for groups of consumers or basing the contents, arrangement and presentation of the service on intelligence gathered during earlier visits by the consumers.

In contrast to broadcasting services, there is less cost benefit for webcasters in a greater number of consumers, because, in principle, the transmission costs increase proportionately to the number of consumers. If a Web site becomes successful, the webcaster has to pay for more servers and greater bandwidth. However, in some cases, webcasters rely on advertising the payment for which is often based on the number of hits, or in other words the use of the service. Typical audio servers can support only 100-500 simultaneous listeners. The largest servers can now handle up to only 10,000 simultaneous “streams” (live transmissions or on-demand services): one for each customer. Although video delivery is at present at an early stage, films are already available on the Internet. Networks can become congested by large numbers of simultaneous streams, and when demand exceeds capacity it is impossible for consumers to get a connection at all. That problem may be alleviated in the future by “multicasting,” but the means of delivery to each individual user remains a point to point transmission.

One of the main characteristics of webcasting is that the transmission is always interactive at the machine level. The transmitting server is in active contact with the receiving machine, verifying the success of the transmission, exchanging status reports. This is not the case with broadcasting, where the main transmission is only one way.
Broadcasting Piracy on the Internet

As a result of the huge investments and costs involved in broadcasting and the enormous marketing revenues generated because of the massive appeal of television programs, not to mention the rise of new recording and transmission technology, broadcasting piracy has become a main problem (as illustrated in figure 4.5).

The pirate could steal the signal and bundle it with its own advertising and transmit the same to the public via the Internet; thus competing with the original
broadcaster. In the digital environment, piracy is a severe threat since a digital signal, once received, can be perfectly cloned and reproduced. Pirates are increasingly able to obtain perfect digital copies of broadcast programs from which multiple copies and Internet downloadable/streamable copies can be made and redistributed. Transmission of original broadcast over the Internet i.e. webcasting is also vulnerable to piracy because of the ease with which contents can be accessed and copied. Large segments of the public have access to broadcasting services, and at the same time copying devices have become cheap and commonplace.

Broadcasting and webcasting organizations make use of encryption systems so that only the viewers they authorize could access the programming content. But piracy could affects the market for encrypted transmissions too. Audiovisual pirates analyze/crack the encryption systems and manufacture and distribute unauthorized decoders, black boxes and smart cards. This practice is widespread both in developed and developing countries, and the use and illegal distribution of decoding devices have proliferated.

The notion of “program-carrying signal” relates to the issue of “signal theft.” The pre-broadcast program-carrying signal can be described as the electronic signal carrying program material which is sent via a telecommunications link to a broadcasting organization for use in its broadcasts. Such signals are intended not for reception by the public, but for use by broadcasting organizations in their broadcasts. Therefore, they are not broadcasting, but a point to point transmission by telecommunications links from the site of an event (sports, news or cultural) to one or more national and/or foreign broadcasting organizations for the purpose of enabling the latter’s broadcasting of the event. A broadcasting network (or program syndicator) also sends such signals, for example, to its affiliated broadcast stations. Pirates can intercept the signals, with their content, either at the stage of the pre-broadcast transmission, for example, off a satellite (figure 4.5), or at the stage of the actual broadcast. Since pre-broadcast signals
are often digital, pirates are able to obtain perfect digital clones of the program-carrying signals and content from which multiple streams, copies, downloads or rebroadcasting can be made.

Broadcasts on the Internet will be widespread and one can be sure that piracy will be equally pervasive. In the light of huge promises that webcasting offers, it is essential that clear rules as to the practice of webcasting are adopted in both national and international environment.

**PROTECTING WEBCASTS**

Broadcasting organizations have in the past been granted protection for the result of their investment, their entrepreneurial efforts and their contribution to the diffusion of culture and their public information service. The same interests that initially impelled protection of copyright and neighboring rights for broadcasting now compel adoption of equivalent protections for webcasting. Webcasters create and transmit valuable content reflecting creativity and authorship, as do traditional broadcast media. Copyright and neighboring rights protection should be made available to such works, and protection should not be denied merely on the basis of technical methods of delivering such works to the public. Even for works consisting of retransmissions of terrestrial radio or television broadcasts, it would be illogical and irrational not to offer protection, as piracy over the Internet is more widespread and commonplace.

Webcasts and webcasters do need legal protection for their activities. But what should be the mechanism of protection? Should webcasts and webcasters be protected independent of broadcasting? Or should webcasting be assimilated to broadcasting in terms of protection? Different views have been expressed as to whether such new services should be assimilated to traditional broadcasting. For now, it does not appear that any national copyright law gives express recognition
of, or protection to, webcasters as broadcasting organizations. But the same is being considered around the world at national and international level. In view of convergence of various technologies and services, and considering the threat of piracy both by webcasts and of webcasts, in our opinion, it is only appropriate to assimilate new activities of webcasting to traditional broadcasting.

Let us now examine the national and international framework applicable to the protection of broadcasting and see what and where amendments are needed to effect such assimilation. Until 1961, broadcasting rights were essentially granted at the national level, and not all countries provided for such protection. At the international level, the main rights granted to broadcasting organizations were laid down in the International Convention for the Protection of Performers, Producers of Phonograms and Broadcasting Organizations (the Rome Convention), which was adopted on October 26, 196125. The Rome Convention of 1961 reflects the technological development of the time when it was negotiated. It defines broadcasting as:26

“broadcasting” means the transmission by wireless means for public reception of sounds, or of images and sounds. (Emphasis added)

This definition confines broadcasting to over the air transmissions, excluding coverage for cable transmissions. Protection for cable transmissions has, however, in a number of countries been granted at the national level. Articles 13 of the Rome Convention lay down the minimum rights for broadcasting

25 It came into force on May 18, 1964, and as of now, 68 countries are party to it.
organizations and ensures the exclusive right to authorize or prohibit a number of activities in the realm of broadcasting as follows:27

Broadcasting organisations shall enjoy the right to authorise or prohibit:
(a) the rebroadcasting of their broadcasts;
(b) the fixation of their broadcasts;
(c) the reproduction:
   (i) of fixations, made without their consent, of their broadcasts;
   (ii) of fixations, made in accordance with the provisions of Article 15, of their broadcasts, if the reproduction is made for purposes different from those referred to in those provisions;
(d) the communication to the public of their television broadcasts if such communication is made in places accessible to the public against payment of an entrance fee; it shall be a matter for the domestic law of the State where protection of this right is claimed to determine the conditions under which it may be exercised.

The Agreement on Trade-Related Aspects of Intellectual Property Rights (TRIPS Agreement) does not contain any definitions relating to broadcasting, but it vests in broadcasting organizations rights to prohibit certain acts relating to their broadcasts.28 These acts are: the fixation; the reproduction of fixations; and the

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28 Art. 14(3) of TRIPS reads:

Broadcasting organizations shall have the right to prohibit the following acts when undertaken without their authorization: the fixation, the reproduction of fixations, and the rebroadcasting by wireless means of broadcasts, as well as the communication to the public of television broadcasts of the same. Where Members do not grant such rights to broadcasting organizations, they shall provide owners of copyright in the subject matter
rebroadcasting by wireless means of broadcasts; as well as the communication to the public of television broadcasts of the same. Where Members do not grant such rights to broadcasting organizations, they shall provide owners of copyright in the subject matter of broadcasts with the possibility of preventing the above acts, subject to the provisions of the Berne Convention.

The 1974 Brussels Satellites Convention addresses the question of protection of pre-broadcast program-carrying satellite signals by obliging Contracting States to undertake adequate measures against their unauthorized distribution, but leaving it open whether it should be under public or private law. Among the possible measures is a specific right for broadcasting organizations to take direct action, particularly by means of exclusive rights under copyright or related rights legislation. Another possible means is telecommunications law, in which case normally a telecommunications authority will take action to protect the secrecy of the signals.

Under international copyright and related rights treaties the word “broadcasting” generally has been understood as transmission via Hertzian waves. A certain number of national copyright laws give providers of cable-originated programs, who do not merely distribute broadcasts simultaneously and unchanged, rights similar to those granted to broadcasting organizations, insofar as they are considered organizations which are analogous to broadcasting organizations, that is, offering program services for reception by the public at large.

The concept of broadcasting has to some extent been updated by the WIPO Performances and Phonograms Treaty (WPPT), adopted in 1996, in particular as regards satellite broadcasting, as it takes account of technological developments since the Rome Convention. This is done by combining the definitions of the Rome Convention and the 1974 Brussels Convention Relating to the Distribution
of Programme-Carrying Signals Transmitted by Satellite (the Satellite Convention). In this context, the concept of encryption is also introduced. The definition of broadcasting given in Article 2(f) of the WPPT reads as follows:

Broadcasting means the transmission by wireless means for public reception of sounds or of images and sounds or of the representations thereof; such transmission by satellite is also “broadcasting”; transmission of encrypted signals is “broadcasting” where the means for decrypting are provided to the public by the broadcasting organization or with its consent. (Emphasis added)

India is a member of the TRIPS Agreement, but not of the Rome Convention; though the Copyright Act, 1957 fully covers the minimum standards of the Rome Convention and even goes further to it in providing protection to cable originated broadcasting. The definition of broadcasting in provided in section 2(dd) of the Copyright Act, 1957 which reads:

‘Broadcast’ means communication to the public--

i. by any means of wireless diffusion, whether in any one or more of the forms of signs, sounds or visual images; or

ii. by wire; and includes a re-broadcast. (Emphasis added)

Further, communication to the public is defined as:

‘Communication to the public’ means making any work available for being seen or heard or otherwise enjoyed by the public directly or by any means of display or diffusion other than by issuing copies of such work regardless of whether any member of the public actually

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29 Art. 2(f), WIPO Performances and Phonograms Treaty, 1996.
30 S. 2(dd), Copyright Act, 1957.
Broadcast reproduction right.--
1. Every broadcasting organisation shall have a special right known as "broadcast reproduction right" in respect of its broadcasts.
2. The broadcast reproduction right shall subsist until twenty-five years from the beginning of the calendar year next following the year in which the broadcast is made.
3. During the continuance of a broadcast reproduction right in relation to any broadcast, any person who, without the licence of the owner of the right does any of the following acts of the broadcast or any substantial part thereof,--
   a. re-broadcasts the broadcast; or
   b. causes the broadcast to be heard or seen by the public on payment of any charges; or
   c. makes any sound recording or visual recording of the broadcast; or
   d. makes any reproduction of such sound recording or visual recording where such initial recording was done without licence or, where it was licensed, for any purpose not envisaged by such licence; or
   e. sells or hires to the public, or offers for such sale or hire, any such sound recording or visual recording referred to in clause (c) or clause (d), shall, subject to the provisions of section 39, be deemed to have infringed the broadcast reproduction right. (Emphasis added)

Section 37 of the Copyright Act, 1957 which protects broadcasts reads:31

31 S. 37, Copyright Act, 1957.
The minimum rights granted to broadcasting organizations under the Copyright Act and the Rome Convention are the rights to authorize or prohibit: (a) the re-broadcasting of their broadcasts; (b) the fixation of their broadcasts; (c) the reproduction of fixations of their broadcasts; and (d) the communication to the public of television broadcasts if such communication is made in places accessible to the public against payment of an entrance fee.

The object of the protection under article 13 of Rome Convention, 1961 and section 37 of the Copyright Act, 1957 is not defined but from the definition of “broadcasting” in section 2(dd), it appears that it is the signals constituting the wireless transmission of images and/or sounds. Accordingly, the object of the protection is the signals themselves and not to the content of what they transmit. The content part is independently protected as such. So, protection is granted to broadcasting organizations for their signals independently of the copyright and related rights protection of the content. Theoretically, it is possible to separate the signals from the content, which they carry. However, in practice, that distinction is almost impossible. Pirates are mainly interested in the content which is carried by the signals, but it may be recalled that copyright law does not protect all content and pirates can also be interested in signals carrying unprotected content. In this regard, the distinction between signal and content is worth noting. The broadcasting organizations get protection for their signals transmitted which may carry copyrighted or non-copyrighted content. As far as content is concerned, it is separately protected under copyright law and such protection is totally independent of the protection of broadcasts.

The subject of protection, is the broadcasting organization. Which type of organizations are protected as broadcasting organizations under the Copyright Act, 1957 or the 1961 Rome Convention is not expressly clarified. Although there is no definition in either of the instruments of “broadcasting organization,” it was and is generally accepted that these are organizations which provide their

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32 Supra note 27.
broadcasting services to the general public over Hertzian (wireless) waves and wires. In this respect, following technological developments new program transmitting entities have emerged, and the question has been raised whether every entity distributing signals and involved in the distribution of programs would qualify as a broadcasting organization and benefit from the protection. With the arrival of the Internet it has become comparatively easy and within the reach of individuals to engage in lawful and unlawful activities of webcasting. Practically, it would take little time to set up an Internet radio station, which on the off-line media would be a Herculean task and was typically restricted only to organisations. Therefore, in legal instruments we find that the subject of protection is invariably ‘broadcasting organisations’. In this light it becomes necessary to define afresh the subject of protection for broadcasting activities.

To protect Internet webcasting, the definition of “broadcasting” in the Copyright Act should be updated in two ways. First, the definition should encompass ancillary data that may be included in the transmission. As noted above, Internet transmitting organizations may send related and ancillary text, graphics and images along with the audio or audiovisual works. Such data may include, for example, information concerning the works being performed; information concerning the performers; links to the Web sites of online retail establishments from which the listener or viewer can purchase the particular phonogram or audiovisual work being broadcast, or tickets to concert performances, etc. As a whole, this capacity results in rich and creative forms of broadcasting content which merit full protection. In this respect we note that even traditional broadcast media also have been embedding data into their signals, such that suitably-equipped receiving devices may display data such as the name of the broadcast station, weather, traffic, sports scores, stock information, and so forth. The definition of “Broadcasting” should include all transmission modes and associated text and data. We, therefore, propose that the definition should read:

3 The Copyright Act, 1957 specifically includes transmission by wires under s. 2(dd).
‘broadcast’ means communication to the public--
i. by any means of wireless diffusion, whether in any one or 
more of the forms of signs, sounds or visual images or any 
related or ancillary data or text transmitted by the 
transmitting organization; or
ii. by wire; and includes a re-broadcast;

Second, the expressions used in international treaties is “public reception”34 and 
the expression used in the Copyright Act, 1957 is “communication to public”35, 
which seem to imply that only the process of ‘point-to-multi-point’ is covered 
under the definition of broadcasting leaving the process of ‘point-to-point’ 
transmission in case of webcasting. Therefore, the concept of “communication to 
public” in section 2(ff) of the Copyright Act, 1957 should be elaborated and 
should explicitly include point-to-point transmissions along with broad diffusion of 
signals or ‘point-to-multipoint’ transmission.

Article 1436 of the Rome Convention states that the term of protection shall last at 
least until the end of a period of twenty years computed from the end of the year 
in which the broadcast took place. Section 3737 of the Copyright Act, 1957, on 
the other hand, states the term to be twenty five years. In this regard, there is no 
need to take any position on the appropriate term of protection for webcasts; just 
the term of protection for webcasts should be coextensive with the term of 
protection for other broadcasts.

34 Supra note 26.
35 Supra note 30.
36 Art. 14, International Convention for the Protection of Performers, Producers of Phonograms 
and Broadcasting Organizations, 1961 reads: 
The term of protection to be granted under this Convention shall last at least until the end 
of a period of twenty years computed from the end of the year in which:
(a) the fixation was made for phonograms and for performances incorporated 
therein;
(b) the performance took place for performances not incorporated in 
phonograms;
(c) the broadcast took place for broadcasts.
37 Supra note 31.
The legal framework applicable to broadcasting was normally specific and well defined. In most countries the broadcasting sector was, and it remains today, extensively regulated. The rules to which broadcasting organizations are subject range from the license required for the activity as such, procedures for the allocation of frequencies, rules relating to the public mandate, regulation of the content itself like language quotas, local cultural content, or rules for the protection of young people. Because of technology the same activities can now be undertaken and transmitted over the Internet without any rules or regulations. It is just a matter of time when national governments would realise the importance of regulating webcasting otherwise the entire regulations for the broadcasting sector will be rendered redundant.

CONCLUSION

Broadcasting organizations have in the past been granted protection for the result of their investment, their entrepreneurial efforts and their contribution to the diffusion of culture and their public information service. The same interests that initially impelled protection of copyright and neighboring rights for broadcasting now compel adoption of equivalent protections for webcasting. Webcasters create and transmit valuable content reflecting creativity and authorship, as do traditional broadcast media. Copyright and neighboring rights protection should be made available to such works, and protection should not be denied merely on the basis of technical methods of delivering such works to the public.

Webcasts and webcasters do need legal protection for their activities. But what should be the mechanism of protection? In view of convergence of various technologies and services, and considering the threat of piracy both by webcasts

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38 “Protection of Broadcasting Organizations”, Technical background paper prepared by the WIPO Secretariat, WIPO document No. SCCR/7/8 (April, 2002).
and of webcasts, in our opinion, it is only appropriate to assimilate new activities of webcasting to traditional broadcasting.

The subject of protection, in international instruments and national laws is the broadcasting organization. Although there is no definition in either of the instruments of “broadcasting organization,” it was and is generally accepted that these are organizations which provide their broadcasting services to the general public over Hertzian (wireless) waves and wires\(^39\). With the arrival of the Internet it has become comparatively easy and within the reach of individuals to engage in lawful and unlawful activities of webcasting. In this light it becomes necessary to define afresh the subject of protection for broadcasting activities.

To protect Internet webcasting, the definition of “broadcasting” in the Copyright Act should be updated in two ways. Internet transmitting organizations may send related and ancillary text, graphics and images along with the audio or audiovisual works. Such data may include, for example, information concerning the works being performed; information concerning the performers; links to the Web sites of online retail establishments from which the listener or viewer can purchase the particular phonogram or audiovisual work being broadcast, or tickets to concert performances, etc. So, the definition should encompass ancillary data that may be included in the transmission. Second, the expressions used in international treaties is “public reception” and the expression used in the Copyright Act, 1957 is “communication to public”, which seem to imply that only the process of ‘point-to-multi-point’ is covered under the definition of broadcasting leaving the process of ‘point-to-point’ transmission in case of webcasting. Therefore, the concept of “communication to public” in the Copyright Act, 1957 should be extended to include the making available of transmissions whether by broad diffusion of signals or ‘point-to-point’ transmission.

\(^39\) The Copyright Act, 1957 specifically includes transmission by wires under s. 2(dd).
The Rome Convention states that the term of protection shall last at least until the end of a period of twenty years computed from the end of the year in which the broadcast took place. Whereas the Copyright Act, 1957 states the term to be twenty five years. In this regard, the term of protection for webcasts should be coextensive with the term of protection for other broadcasts.

To sum up, webcasting needs the same level of protection as broadcasting. In this respect, it was appropriately stated by the Werner Rumphorst:40

We should look at the Internet the same way we look at broadcasting. What does it do in the end? Is it mass communication to the public? Well, then we should treat it appropriately.

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40 Werner Rumphorst (Director, Department of Legal Affairs of the European Broadcasting Union), Fifth Panel Discussion at 85 (WIPO Publication 757 of 1998), WIPO World Symposium on Broadcasting, New Communication Technologies and Intellectual Property.