

# two solitudes consulting

Exploring the convergence and collision of traditional and new media

## *Changing channels: alternative distribution of television content*



Alan Sawyer

two solitudes consulting

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A study of alternative distribution of Canadian television and related content, alternative distribution of all television and related content to Canadians, and a comparative analysis of the current state of alternative distribution in Canada and the United States



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## Scope

For the purposes of this study, we limit the scope of the word ‘television’ to content that is professionally produced and is distributed, at least in part, by way of conventional television distribution means used in Canada (over-the-air broadcasting, cable TV distribution, direct-to-home satellite distribution and IPTV (Internet Protocol TV) services offered by telephone companies). Further, we’ll focus on episodic programming, primarily 30- and 60-minute programs.

Within that context, we’ll examine *Canadian television* as well as *television in Canada* – and there’s much more than a semantic difference between the two. For the purposes of this study, we’ll define *Canadian television* as television programming (as defined above) that is produced in Canada and we’ll define *television in Canada* as television programming (again, as defined above) that is distributed in Canada *regardless* of the country in which it was produced.

The study has a particular interest, as well, in comparing the current state of alternative distribution in Canada and the U.S. and in the comparison of alternative distribution channels for like content that is broadcast in both Canada and the United States.

Since DVD sales are now a *de facto* standard distribution technology for previously broadcast TV content, they have been excluded from this study.

Video-On-Demand (VOD) offerings from Broadcast Distribution Undertakings (BDUs – cable companies and other regulated distributors) are also outside of the scope of this study.

## Limitations

The information collected for this study was that which was directly observed by way of Internet-based activity and experimentation using both U.S.- and Canadian-based IP addresses accompanied by that which is freely available in the public domain. Content requiring specialized hardware (such as Vudu) and services that are unavailable in Canada (or via a U.S.-based IP address) were not studied at a detailed level but were, in some instances, examined based on publicly available information.

## Terminology

### Broadcaster

Throughout this document, we’ve used the term ‘broadcaster’ to refer to entities (or a collection of related entities, such as a television network and its affiliates) that hold license(s) issued by the CRTC in Canada or the FCC in the United States. For clarity, and ease of differentiation, we’ve used the term ‘aggregators’ to refer to entities that are not licensed by either of the aforementioned bodies and who operate exclusively in non-regulated environments.

### Evening program

For the purposes of this evaluation we defined evening programming (and ‘evening/primetime’) programming as programs airing within the 7:00 PM to 10:59PM window.

## Disclaimer

Whether true or not, they say that by the time they finish painting San Francisco’s Golden Gate Bridge it’s time to start over again back at the beginning. The same could be said of any study of new media today. The rate of change is so fast

that by the time all of the information is collected, some of it is inevitably obsolete. The information used in this study was collected over throughout January 2008. Due to the breadth of this study, in most cases, that only afforded a single point-in-time observation of any given offering and it must be realized that while this may give an indicative insight into the availability of a program, or the distribution strategies of a broadcaster, it can't, in a constantly changing environment, be said to represent an absolute or complete picture. Indeed, in some cases, broadband streaming of a program that was available from a broadcaster one day had vanished without a trace the next. And, just because we couldn't find something, doesn't mean it wasn't there. Sometimes we only found video content by accident after we'd given up hope. While most broadcasters make the video content quite prominent, some have it well hidden.

Further complicating matters was the greater than usual flux in the industry due to the WGA strike during the study period. Network programmers were juggling broadcast schedules – and broadband episode availability is often tied to the broadcast air date. Shows disappeared from broadcast as the supply of new episodes ran out and their broadband counterparts often seemed to disappear, too – perhaps a business decision, or perhaps part of the contractual terms.

As a result of the point-in-time nature of the study, and the WGA strike, specific observations about individual programs or broadcasters must be understood to be based on point-in-time observations that may not be reflective of the program or broadcaster actual or regular availability. In an attempt to counterbalance this effect and gain a more accurate picture of what would have been found in the absence of the strike, press releases and other anecdotal evidence of broadband (or other) alternative distribution channel availability of programming has, in some cases, been considered in addition to empirical evidence of content availability.

## Opinions expressed

The opinions expressed in this report are solely those of Two Solitudes Consulting (a division of Assyst Consulting Inc.).

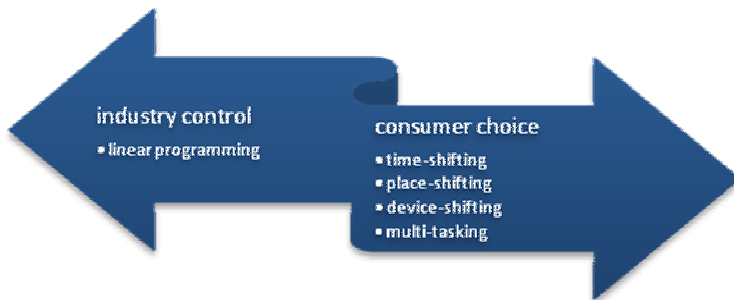
## Executive summary

The last few years have seen an explosion of video content delivery through alternative delivery channels, largely in response to changing consumer expectations. The traditional TV audience is eroding as more viewers (particularly younger viewers) turn to the Internet and mobile devices for content.

Consumers are less interested in watching linear programming that is tied to a single-purpose device.

A shift is occurring from a world in which the industry is in control to one in which the consumer, if not in fact in control, at least has many options and choices now available to them.

The eco-system for alternative content delivery is immature and lacks stability (witness the labour strife within the industry in the last twelve months in Canada and the U.S.). Consumer uptake is tied directly to the availability of the content that consumers want to watch, and Canadian broadcasters offer little of that content at their websites. We believe that pre-roll (and intra-program) video advertising is emerging as the *de facto* standard for broadband content delivery and it is significant to note that while both Canadian and American broadcasters are doing more of this type of advertising, American ads tend to be mostly from paying corporate sponsors while Canadian ads tend to be largely internal programming promotions. 89% of American broadcasters that we examined had corporate sponsorship for pre-roll advertising versus 45% for Canadian broadcasters. The lack of ad dollars flowing to Canadian broadcasters is likely one major reason that the broadcasters haven't made more content available and until more revenue can be generated to offset costs, we won't likely see that picture change.



The media industry in general, and broadcasters in particular, have taken steps to replicate the traditional 'real-world' market boundaries on alternative distribution channels. By far the most common approach to this is geo-blocking (also known as geo-filtering and geo-fencing). Geo-blocking is done using the consumer's IP (Internet Protocol) address<sup>1</sup> to determine where the consumer is located. It's an imperfect technology in that it is not always accurate, but beyond that, as our study concluded, it can be easily circumvented (a practice we call geo-spoofing). It's important to note, too, that this is not just about Canadians going to American sites. Geo-spoofing is a common practice worldwide in order to gain access to content that is otherwise unavailable. Canadian broadcasters are streaming content to out-of-market geo-spoofers, too. In one sense, geo-spoofing is not dissimilar to the once-rampant gray-market use of American satellite signals in Canada in that both do nothing to support the Canadian broadcasting industry. Indeed, we believe that the practice is in fact harmful to the industry as it leads to broadcasters incurring costs to stream to out-of-market consumers and causes advertisers to reach (and pay for) unintended out-of-market audiences. If the practice is

<sup>1</sup> A unique identifier for every Internet connection.

rampant, the return on investment for advertisers is diminished and may lead to fewer advertisers supporting these nascent distribution channels.

If the desired content was available through a domestic distributor, consumers wouldn't cross virtual borders ('geo-hop') to get it. . Recognizing, though, that this exposure exists, we wonder how long U.S. broadcasters will continue to tolerate the fact that Canadian broadcasters aren't making the content available in the Canadian market. If the content continues to be unavailable through the broadcast licensee, will U.S. broadcasters and/or studios open the borders to Canadian audiences and present them with Canadian ad content (funded by Canadian ad dollars migrating south to the U.S.)?

Geo-spoofing isn't the only way to acquire content that isn't otherwise available. Torrent distribution of unlicensed content is very common. A consumer may use torrents to obtain content that is unavailable in their market, content for which they would otherwise have to pay a subscription fee in some manner, or content that is in a format that they can't otherwise obtain (high-definition, for example, or formatted for a mobile device). Or, it may simply be that they've missed an episode of a program and there's no alternative distribution method for that content available to them. Canada's lack of alternative content distribution is driving many Canadians 'underground' to get the content that they want.

Broadcasters make content available over broadband in a variety of ways. The two most common are video portals and program portals. A video portal pulls together video content from many programs in one location. With a program portal, video and non-video content related to a program are both found at the specific area devoted to that program at the broadcaster's website. Often the two are both used, with some video content at the program portal and some video content (usually more video content) at a video portal. In addition, some broadcasters extend their brand presence through the use of third-party aggregators such as Hulu or Veoh. In some cases, the video is hosted by those aggregators, while in other cases the aggregator directs traffic to the broadcaster's website. In our analysis of broadcaster video usage, we counted only video that was hosted at a broadcaster's website or at a webpage specifically devoted to a program to which the broadcaster's website has a link.

U.S. broadcasters are very advanced in terms of making broadcast content available through broadband. Major U.S. broadcasters make between 52 and 80% of their non-news evening/primetime programming available in full-episode format on-demand at their websites. Canada's two largest private English-language broadcasters, by comparison, offer much less of their content this way (CTV offers 24% and Global TV offers 15%).

94% of U.S. broadcasters make some amount of ancillary content related to broadcast programming available, while only 47% of Canadian broadcasters do so. Ancillary content often includes behind-the-scenes information, blooper reels, and 'minis' or 'mobisodes' – short stories that are done with the same actors and either extend the storyline or explore different directions. This type of content is a differentiator for broadband delivery and is a 'value add' for the consumer and provides a compelling reason to visit broadcaster websites.

Canada's private French-language broadcasters offer much less broadcast-related video content than their English-language counterparts but offer considerably more programming on a broadcast-broadband simulcast basis.

Broadcast-quality programming is emerging on broadband without broadcaster involvement. Quarterlife has built an integrated television program and social network community environment on the Internet. Although it has since been picked up for broadcast by NBC, Quarterlife demonstrates that this can be a viable approach for producers, without having to have a broadcast deal in place. Canadian-made Sanctuary is another example of broadcast-quality programming created expressly for the broadband world.

Our case study on Degrassi: The Next Generation, a Canadian program popular on both sides of the border, revealed that American residents have access to a higher-resolution and more-interactive broadband streaming experience than Canadians do.

The CSI: Crime Scene Investigation case study was very telling. While American consumers can view full episodes online through the CBS website and through other sites (Veoh, AOL Video and Joost), Canadians have no access whatsoever to the content. Americans can also purchase episodes of CSI at iTunes the day after they are broadcast on CBS. iTunes does not offer CSI to Canadians. Overall, Americans had *many* alternative viewing options for CSI while Canadians had *none*.

While top-rated Canadian broadcast content is available to Canadians by way of alternative delivery channels, the reality is that the most popular broadcast content in Canada is American and Canadian viewers have little or no access to most of this programming by way of alternative delivery channels.

When we consider the availability of streaming broadband content through broadcasters and third-party aggregators (and the level of interactivity offered), the availability of paid download content through iTunes and other services, American consumers are clearly much-better served on all levels by alternative distribution channels than their Canadian counterparts.

American consumers have considerable access to alternative content delivery methods and the worlds of traditional and new media are blending in the United States. In Canada, however, traditional and new media largely remain separate, co-existing and in conflict with each other (the two solitudes of the media world).



## Key findings

Geo-blocking is the *de facto* standard for media companies attempting to emulate traditional geographic boundaries on the Internet. It is used for almost all full-length episodes on broadcasters' websites, and is used for much of the ancillary video and clip content. As we demonstrate in this study, though, it can be easily circumvented.

Credit card identification is much more effective, and not easily circumvented, but is not a palatable proposition for content viewing where a payment is not involved.

In both Canada and the U.S., most broadcasters have some degree of broadcast-related video content available on their websites. American broadcasters have far more non-news primetime or other evening program available in full-episode format on their websites than Canadian broadcasters do.

Even the major U.S. television network offering the least content (CBS at 55%) offers twice as much programming as the Canadian network offering the most content (CTV at 24%). The CW (80%) offers about three times as much content as CTV, and five times more than Global TV (15%).

Global TV lags far behind CTV, offering only about 60% of the amount of full-episode content that CTV does.

French-language broadcasters lag far behind English-language broadcasters but offer more broadband simulcasting of programming.

There was a clear predominance of domestic content at both U.S. and Canadian broadcaster websites, although Canadian broadcasters had much more American content than American broadcasters had Canadian content.

Ancillary content (interviews, recaps, behind-the-scenes clips and so on) was found at 94% of the U.S. broadcaster websites but only at 47% of the Canadian broadcaster websites. Ancillary content is a major differentiator for broadband delivery compared with broadcast programming and its presence or absence may reflect the desire of the broadcaster to have consumers go to the web for content. The same can be said, of course, for the availability of full-episode content on an on-demand basis.

The amount of content available at specialty-service broadcaster websites varies widely, though this may be in part because many of these are subscription services. There is no practical means to limit the broadband content to the paid subscriber base, so these channels may be understandably reluctant to make their content available online.

Beyond the content that is available through broadcaster websites, Canadians have few alternative content delivery options available to them. When options are available, access to top-rated content is very rare.

Americans have access to many content aggregators for popular broadcast content that don't offer services in Canada (for example, Hulu and Amazon Unbox). Made-in-Canada services that offer similar capabilities (for example, canoe.tv, JumpTV, the Bell Video Store and MoboVivo) don't have the content that is most popular with Canadian audiences. Services that are available in both countries including iTunes, Joost and Veoh don't offer the same content to Canadians

that they do to Americans and none of the top-rated U.S. content is available to Canadians through either of these services.

The case study for CSI illustrates this point. Americans have *many* options with respect to alternative content delivery for CSI – while Canadians have *none*.

Canadian content is well-represented on Canadian broadcaster websites, at Joost (an Internet television content aggregation and distribution service), and at the recently launched TV section of Apple's iTunes Canada store. It is also well represented in the form of illegal torrent files.

Although 42% of the TV content at the iTunes store is Canadian, that does not translate into a high purchase rate for Canadian content. In one sampling, eight of the top 10 episode sales and 9 of the top ten series sales were of American content. Of course, this is fairly consistent with the ratio of U.S. to Canadian programming in the broadcast ratings, and on primetime schedules, so it is not very surprising.

The majority of the money Canadians spend on video content at iTunes is money that leaves the country. In those cases involving Canadian content and/or deals involving Canadian broadcasters, some of it will come back. Since iTunes is the only seller of any top-rated content in Canada, this is significant.

iTunes does not offer any French-language programming. LaBanqueVideo Sympatico, the French versions of the Bell Video Direct service, offers only a small amount of French-language content. In general, though, while other on-line sales services do address the Canadian consumer, the availability of the most popular programming among Canadians at iTunes, although itself quite limited, exceeds all others.

Several broadcasters are doing broadcast-broadband simulcast programming and it is more common in Canada than the United States. Simulcasting is more common for French-language programming than for English-language programming. English-language broadcasters are more likely to offer simulcasting on a paid subscription basis (for example, BNN and CTV Newsnet) while French-language broadcasters offer simulcasting of similar services at no charge (for example, ARGENT and LCN).

Pre-roll (and intra-programming) video advertising is increasingly common and is, we believe, emerging as the *de facto* standard for streaming content monetization. U.S. broadcasters use pre-roll advertising for video content more than Canadian broadcasters (56% versus 42%), are far more likely to have external corporate sponsors for the pre-roll advertising (89% versus 45%), are far less likely to use pre-roll for internal promotion (22% versus 72%) and are far more likely to provide a click-through value add experience for the advertisers (78% versus 36%). Since the difference in the adoption of pre-roll advertising is not that significant (56% versus 42%) but the incidence of corporate sponsorship is (89% versus 45%), there's an indication that either broadcasters aren't selling the spots or advertisers aren't buying the spots – or both. The lack of corporate ad dollars flowing into the system may well be a factor in the significantly lower level of content availability in Canada.

There is no high-definition Canadian content available by way of alternative distribution channels. While most American broadcasters also don't offer high-definition content, ABC offers 20% of their primetime programming in HD (720p) broadband streaming.

Whether for streaming or downloading, there's generally a lack of disclosure of the technical specification for content in both Canada and the United States. Until the stream is started, the viewer has little idea of what the quality of the experience will be. Disclosure is a bit better for download services but is still lacking in sufficient information. Digital rights management (DRM) policies should also be clearly disclosed prior to purchase but aren't always.

Mobile carriers all offer about the same amount and type of content for downloading and streaming. Top-rated broadcast programming content generally isn't available.

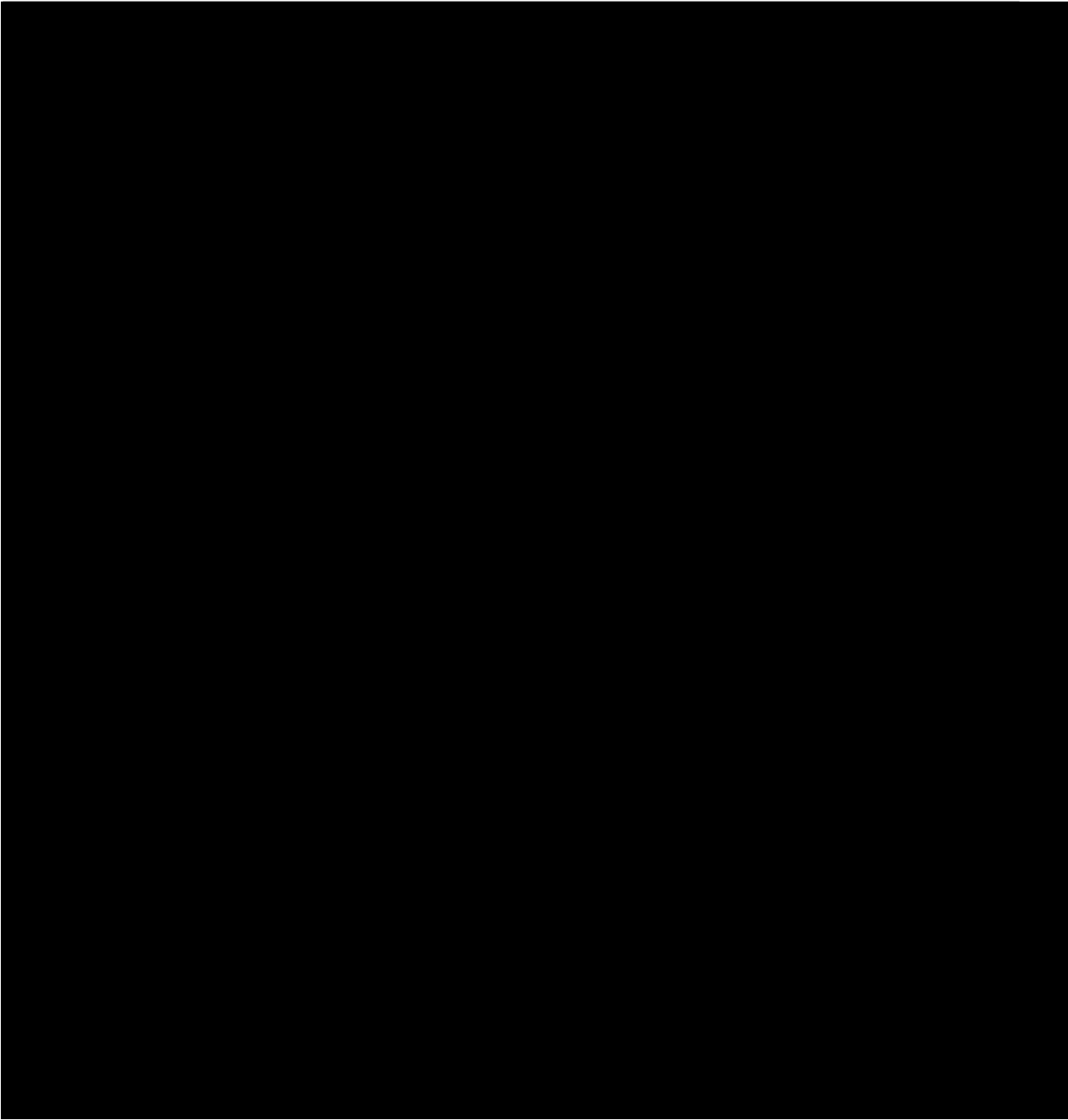
Most video players used by broadcasters don't offer the consumer much flexibility in the control of the image size. The choices are usually limited to two, either standard and enlarged sizes or standard and full-screen. Some players, including the Move Media Player, offer more flexibility. The Move Media Player, too, was the only player used by broadcasters that dynamically adjusted the bitrate in response to the available bandwidth on the consumer's computer. The video server monitors feedback from the player and adjusts the bitrate used to provide a steady, constant stream at the best possible bitrate available at that time. That is, in order to provide smooth playback when the broadband network connection slows down, the server switches seamlessly to a version of the feed that is encoded at a lower bitrate. When the connection gains speed, the server switches to a higher bitrate.

The players available from third-party streaming content aggregators such as Joost and Veoh offer much better experiences than most players used by broadcasters.

We only found one instance of a broadcaster selling downloadable content directly to the public and that was the Canadian broadcaster Treehouse (a Corus Entertainment property) through its Treehouse Direct service.

Illegal torrent versions of popular programming abound and include both Canadian and U.S. content (as well as a wealth of content from other countries). Dubbed or subtitled versions of Canadian and U.S. programs can often be found in other languages.

**Key facts**



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**Approximate percentage of evening/primetime full-episode content available on-demand at major private broadcasters' websites**

|                  |     |
|------------------|-----|
| <b>The CW</b>    | 80% |
| <b>Fox</b>       | 68% |
| <b>ABC</b>       | 60% |
| <b>CBS</b>       | 55% |
| <b>NBC</b>       | 52% |
| <b>CTV</b>       | 24% |
| <b>Global TV</b> | 15% |
| <b>TQS</b>       | 1%  |
| <b>TVA</b>       | 0%  |

# PART I

## Introduction and background information

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### Introduction

This study is Canadian in focus but the issues it examines affect all developed nations – and not just those that are particularly vulnerable to being overrun by foreign content at the expense of domestic media industries. Video content, in part because of its intense bandwidth requirements, is causing media companies to re-define what it means to live in ‘the global village’ and, indeed, is changing the very nature of the Internet.

### Methodology

We examined approximately 80 programs and 70 broadcaster websites. Of those, a detailed analysis was done for 26 Canadian programs and 12 U.S. programs, and of 36 Canadian broadcasters and 16 American broadcasters.

We examined the availability of content at broadcasters’ websites and through all additional sources we could find.

For programs such as *Degrassi: The Next Generation* and *CSI: Crime Scene Investigation* that are popular in both Canada and the U.S., we did a comparative analysis of the options available to consumers on each side of the border.

In order to examine the experience available to consumers in the United States, software was used to alter our IP (Internet Protocol) address to an American IP address as this is what is used to determine access to streaming content. (For paid download content services, the available content can be seen but a credit card with a U.S. billing address is required to make a purchase.) Because we were evaluating not just the availability of content but also the quality of the streaming experience, we needed to ensure that the redirection involved in altering our IP address did not adversely affect the experience we were having. In order to ensure that such was not the case, a control test was done to compare our Toronto results with actual results from Chicago, Illinois. This test proved that no degradation of the streaming experience was occurring (see [Appendix B: Bandwidth control test](#) for more information on this test).

### About image quality

The transmission speed for video content is referred to as the content *bitrate*. Some players disclose the bitrate for content but most don’t, and when they don’t, it is difficult if not impossible to determine the bitrate since common players such as Windows Media Player and Flash will utilize excess available bandwidth to download and cache content

at a faster than 'real time' rate. For example, in one test, a segment of a Corner Gas episode with a run time of 7:23 was completely cached in less than a minute, using an average rate of 5.1 mbps.

The bitrate provides an indication of the bandwidth required for a stream or download and can be an indication of the quality of the image. A higher bitrate, though, is not a guarantee of a better quality image as the bandwidth required for a comparable image will vary depending on the compression technique (the CODEC<sup>2</sup>) used. Many factors determine the bitrate. The resolution (size) of the image is one key factor, but other factors come into play including the colour depth, the frame rate, the audio encoding format and rate and the CODEC itself (some CODECs provide more efficient image compression and some provide more visible artifacts after decompression).

A higher-resolution image alone doesn't mean a better overall experience because the other factors mentioned above can combine to deliver an inferior (though larger) image.

Where bitrate information was available we recorded it and have provided illustrative and comparative examples for different content in this document. Image resolution is much easier to determine, and even when the player won't identify it, it can be measured on the screen (assuming that the player starts at the 'native' resolution (that is, the actual resolution at which the image was encoded)).

[A related cautionary note concerning bandwidth usage... with players that attempt to download in faster-than-real-time when the bandwidth is available, pausing the program doesn't stop the download process. So, even if you pause the playback after one minute of a 30-minute program, the entire 30-minute program may still be downloaded, unless the window is closed. Sometimes – though not often – a player has a 'stop' button that will actually stop the transmission process].

## Why do people look to alternative sources for content?

There are many reasons that consumers look to alternative sources for content. The main reasons relate directly to *cost, convenience and choice*.

### Cost

For many, the opportunity to acquire content at little or no-cost over the Internet is a compelling proposition. The costs associated with traditional television consumption can be weighty. To begin with, there's the need for a specialized device – the TV set – or, as a more recent alternative, a TV tuner for their computer. On top of that, if the consumer wants more choice than they'll get with 'rabbit ears', there's a cost associated with signal acquisition, whether that be an antenna to receive over-the-air (OTA) signals or a subscription with a Broadcast Distribution Undertaking (BDU) – satellite, telco-IPTV or cable. Traditional TV, with its associated costs, is considered by many to be a discretionary expense and is one that many, particularly younger consumers, choose to forego. By contrast, again particularly

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<sup>2</sup> The word CODEC is derived from COmpression-DECompression and there are many, many different CODECs available for video content compression.

amongst the younger demographic, a computer with a broadband connection is a must-have for many and is, therefore, often a higher priority than having a conventional TV set and subscription services.

As always, too, there are some who will always practice cost avoidance, given the opportunity, saying “why pay when you can get it for free?”

## Convenience and choice

True convenience for the consumer means allowing them to watch what they want (*content choice*), at the time they want (*time-shifting*), wherever they want (*place-shifting*), on the device of their choosing (*platform-shifting*), and often simultaneously in conjunction with other activities (*multi-tasking*).

### Content choice

Setting aside the cost issues already discussed, no conventional distribution technology, as implemented today, can offer the consumer the same array of content that alternative distribution technologies can. Increasingly, consumers want content that is not available to them through traditional, regulated distribution means. Alternative distribution technologies can make a wealth of content available to consumers. Granted, in some cases that choice only exists through ‘grey market’ or outright illegal approaches, yet these are the realities of our times, and they’re not letting that be a barrier to their acquisition of such content.

Conventional distribution doesn’t address the desire for content from past seasons or the 50+-year long tail of television content. While some shows may be available in syndication, at any given time that’s a very small subset of all of the TV content that exists. As more and more older content is encoded (digitized), alternative distribution channels offer a means to make this content available that would otherwise be impractical.

In addition to long-tail content, there is a world of content out there – so much that only a small fraction ever makes it to a Canadian broadcaster’s programming schedule. Yet sometimes that is what consumers want to see. Sometimes, too, it is a matter of the content *not yet* being available on a Canadian broadcaster. For example, the Canadian broadcast schedule may be behind the U.S. schedule for the same show, as is the case at the time of this writing with *Degrassi: The Next Generation*. In this instance, both the Canadian broadcaster (CTV) and the U.S. broadcaster (The N) are airing season 7 but The N has aired seven episodes thus far compared to one by CTV<sup>3</sup>. On the other hand, CTV has the complete seasons 4-6 available on broadband, whereas The N offers only current-season episodes. Unfettered, these two factors (differing broadcast schedules and differing archival availability) would likely lead to a lot of cross-border traffic.

There is also the desire for content that’s not available to the specific consumer. Perhaps the consumer has no service from a BDU, or a specific channel or program is not available from the consumer’s BDU over via any available over-the-air transmission.

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<sup>3</sup> As of January 20, 2008



## Time-shifting

BDU VOD offerings, and the carriage of distant signals from other time zones, provide some time-shifting capabilities, but these come with built-in recurring costs (subscription fees to basic and, in some cases, premium services). Personal Video Recorders (PVRs, also known as Digital Video Recorders, or DVRs for short) and DVD recording devices offer greater flexibility (as, of course, does the traditional VCR) but these, too, come with additional hardware costs. For the most part, while these approaches do address the ‘when’ aspect of content consumption, they don’t help with place-shifting or platform-shifting as they are still tied to the traditional at-home TV-set-based experience.

And there’s the very common desire to watch a missed episode – catch-up TV. If the episode is not being rebroadcast in a timely fashion, alternative delivery channels provide other options. No one wants to wait for broadcasters’ summer-time re-runs to be able to fill in the gaps in a season-long story arc.

## Place-shifting

While the idea of watching television content at work, or on the bus, or even in rooms in the home that don’t have a TV set might have struck us as odd only a few years ago, today these and many other scenarios are common realities – but they don’t fit with the traditional TV distribution networks or business models.

## Platform-shifting / content format

You can’t plug a coaxial cable into a cell phone and watch TV. Cell phones don’t have satellite TV receivers, either, or tuners for standard over-the-air TV signals, nor can they connect to a telco-IPTV service.

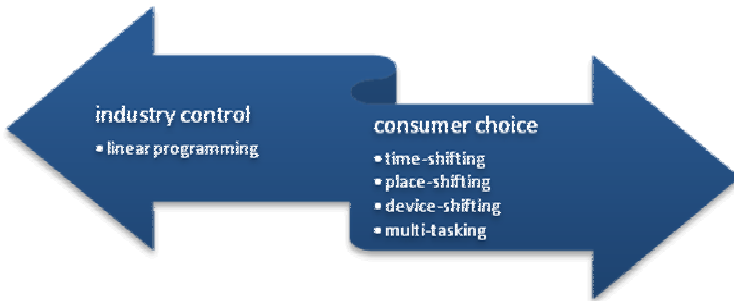
Most computers aren’t set up to connect with these services, either, and when they are, additional equipment is required and content choice is still limited to what these services can provide when connected to a conventional TV set.

Today, though, consumers want to watch TV on portable devices (cell phones, PDAs, laptops, portable gaming consoles) and on fixed-location computers and alternative distribution channels best address these desires. Whether streaming content in real-time or downloading content for later viewing, these devices often require (or benefit greatly from) content that is formatted for the class of device or, in some cases, the specific characteristics of the individual device – and traditional broadcast distribution approaches don’t do that.

Particularly noticeable among younger consumers is a trend wherein television watching is not done with the same single-minded focus it was in the past. Spending time in front of a conventional TV set takes the viewer away from the computer – away from e-mail, instant messaging, texting, gaming and other pastimes that now often co-exist with TV viewing. Indeed, alternative delivery channels offer the viewer the opportunity to experience additional dimensions of the viewing experience that conventional TV, emerging interactive enhancements to conventional TV notwithstanding, doesn’t offer today. For example, though watching in separate locations, friends can ‘chat’ online in real-time about the show they’re watching, often in the player window itself. They can ‘drill-down’ to access additional program information and behind-the-scenes content that simply doesn’t work in the one-to-many broadcast models that exist for conventional content distribution.

Format is often a factor, too. For example, a consumer may want to watch content in high-definition, but may not have available HD service. For that matter, they may not have an HD-capable set, but might have a computer monitor that can display HD content.

The consumer may also want content portability – the ability to acquire content once and move it from device to device.



The *reasons* a consumer seeks content from alternative sources affect the *approach* taken. If the content is needed on another device, for example, or for viewing at another time, sites that provide streaming content don't address the user's needs and a download solution is

more appropriate.

If the content will be viewed on a computer, in a lean-forward, multitasking mode, some streaming solutions are more appropriate for that paradigm; however, if the desire is for the traditional lean-back experience, then different streaming solutions, or content downloading may be appropriate.

In an ideal world, all content would be equally available through all distribution methods, or a single method would exist that was powerful and flexible enough to meet all needs. Regardless of whether either of those states ever comes to pass, it's the world of today and the near-term that we need to consider.

In Canada in particular, as we'll see, the content acquisition choice is often dictated by the delivery methods available for the specific content of interest (this is less often the case in the United States).

### A paradigm shift...

While the traditional TV model addresses some of these emergent consumer expectations to some extent, it falls short of offering a holistic experience that addresses all of these consumer desires. Indeed, these 'shifting' consumer expectations represent a paradigm shift in how we must consider television in its entirety.

When we consider these paradigms together we can see that, from a consumer perspective, the greatest convenience and flexibility comes from alternative delivery channels for content. While the lean-back, at-home big-screen experience isn't going away (it is still a part of most consumers' lives at times, and may indeed be the experience of choice when possible), it certainly no longer holds its monopoly position as the sole television consumption experience desired by consumers.

## A changing consumer

All demographic groups are exhibiting change as a result of technology, but none more so than the younger consumer. They're more tech-savvy, and they operating in a multi-tasking way that is more conducive to many alternative delivery mechanisms than conventional TV distribution is.

MTV, MuchMusic, CW, Fox – they're all targeted at a younger demographic, and, as we'll see, they're all more progressive – and aggressive – when it comes to content delivery on alternative channels.

## An immature and evolving eco-system for new media

For **broadcasters**, existing conventional methods for linear programming content distribution (over-the-air or by way of existing BDU infrastructure) are a cost-effective way of distributing content. The one-to-many model associated with these means of distribution has great economy of scale for broadcasters. What's more, it is predictable in that it does not fluctuate as viewership rises or falls. The cost variables are content-based, not consumption-based. For example, while it may cost more for a broadcaster to deliver a high-definition signal than a standard-definition signal to a cable head-end, the cost is constant regardless of whether there a hundred viewers or a million viewers.

As with conventional distribution, alternative content distribution cost is also impacted by content. The better the quality of the image that is being transmitted, the more it costs. But cost can also be impacted by the level of consumption. Most alternative content delivery is a one-to-one model, and the content must be transmitted once for each viewer. The more viewers, the more it costs. The use of simulcasting, content delivery networks (CDNs) and peer-to-peer (P2P) distribution can help to mitigate this. However, the use of CDNs is the most common of these approaches in use today – and pricing for CDN services is volume-based. The unpredictability of the number of viewers (and, correspondingly, the number of ad impressions) and the delivery costs make this a challenging time for broadcasters.

The business models are a challenge for broadcasters, too. For traditional distribution, there are proven business models that have evolved over the past fifty years and still work, but when it comes to alternative distribution, the business models are immature, and the revenue, where there is any, may not cover costs.

**Producers** are often squeezed to give up the rights for alternative distribution as part of the still-essential broadcast deal – and may indeed need to produce extra content for enhanced platforms at their own expense.

The **creative** forces – the writers, directors, actors and others – are justifiably concerned that their interests in the content may not be adequately addressed in existing collective bargaining agreements, and this has been a major factor in the recent Canadian actors' strike and the on-going American writers' strike. The lack of mutually agreed-upon terms, though, makes rights clearance by producers and broadcasters a real challenge, and hinders progress in making more content available on more platforms.

**Advertisers** are experimenting with – and sometimes embracing – new media advertising, and interactive advertising in Canada is growing at a phenomenal rate; even so, it still represents a small piece of the overall ad spend. Consumer adoption, although increasing rapidly, is still low, and while the ability for advertisers to reach more effectively reach niche audiences with targeted ads is very appealing, the audience numbers just aren't there yet.

**Consumers** are still learning about the new options available to them and, often, are overwhelmed by the plethora of choices and the sometimes-complicated technology.

And, finally, **regulators** are faced with the challenge of formulating policy that balances public interests with innovation and consumer desires. To an extent, that task has been made easier – at least for now – by the commercial practices of the broadcasters as influenced, in part, by the advertisers. Since broadcasting remains the primary – and most lucrative – distribution channel, content deals on alternative platforms tend to reflect broadcast licensing deals. That is, distribution of programs in Canada on alternative distribution channels tends to be a subset of programs for which a broadcast distribution agreement exists, regardless of the country of origin of the content. The Canadian market isn't, therefore, being overrun by alternative distribution of shows or channels that aren't otherwise available through the broadcasters. As an example, no BDU is licensed to carry HBO in Canada, and no one is using unregulated alternative distribution channels to bring it, *in toto*, into Canada 'through the back door'. Selected HBO programming is licensed to a variety of broadcasters, and it's those deals that will continue to drive the availability of such programming through alternative channels as long as two significant factors remain as they are: i) broadcast distribution deals remain more lucrative for content owners, and ii) the cost of alternative distribution remains high. These two factors drive a third that also simplifies the regulatory picture – at this time: the industry-wide practice of replicating traditional market boundaries on alternative distribution channels (more on that shortly).

A further challenge for regulators, of course, is that it's very difficult to effectively regulate that which you can't practically control. Traditional delivery channels are easily monitored and, indeed, require a license from regulators and regulators impose conditions of license upon the operators. The need for regulation, too, in traditional channels is, in part, due to the practical necessity of monopolies that are granted and/or scarcity of spectrum inherent in those models. With Internet-based delivery channels, there's not the same scarcity of spectrum issue, really – where there is any form of scarcity to be considered, it's in the context of contention for the available bandwidth between video content and other Internet services.

### **Progress going forward will be slow**

So... until consumers embrace alternative content delivery at a much greater level, ad dollars will continue to be scarce. Until advertisers spend more on alternative content delivery, broadcasters can't afford to make more content available to consumers. Until compensation agreements are reached with the unions and guilds, broadcasters aren't able to offer all of the content the consumer wants. Until technology improves and costs drop, broadcasters can't operate on the same cost-effective ad-supported model that works for traditional non-subscription services. And until the dust settles a bit, regulators should consider a cautious wait-and-see approach.

## **Replicating traditional market boundaries on alternative distribution channels**

Television broadcast rights are sold by territory. Most broadcasters wish to protect their broadcast content investments and control the broadband distribution of that content within the same territorial boundaries. Producers want those rights respected – and enforced – so that sales to one market don't negatively impact the appeal to a distributor in

another market. Broadcasters wish to control their costs by not streaming their content to out-of-market viewers – and their licensing deals are limited to their own territory, anyway. Advertisers don't wish to pay to reach out-of-market audiences. But the Internet is without borders – or is it?

## Geo-blocking

Also known as geo-fencing and geo-filtering, geo-blocking is a practice that is used mostly by media operations to selectively accept or reject attempts to access content based upon the requestor's Internet Protocol (IP) address. Every computer connecting to the Internet does so with an IP address (usually unique, but may be shared with other computers within a networked office or household environment). Among the characteristics of an IP address is a physical address associated with it that usually accurately reflects where the user is located. In the case of multi-national businesses this can sometimes be misleading as their traffic may be routed through a network in another country before going out to the Internet. For consumers, though, unless unusual steps have been taken, this is a reasonably accurate way of determining from where a consumer is connecting to the Internet.

Note that this identifies the user's current location only and does not in any way give any information, implicit or explicit, about who the user is, where they live, or what their citizenship(s) might be. Therefore, this information has some value, and some limitations.

If we consider conventional television broadcasting, what a consumer sees is based on their current physical location. If they're at home, they see the content that is available through conventional means in that market. If they're in a hotel room in another country, again they see the content that is available through conventional means in that market. So an American traveling to Canada will see what Canadians see without any differentiation based on the fact that he/she is an American or that he/she subscribes to a service like HBO that's not available in Canada.

Services that control access to content solely based on IP-address identification operate similarly. Regardless of the services or subscriptions the consumer may have at home, or the content he/she might have access to using his/her home Internet service, this approach will limit him/her to the content that's available in the local market. An American in Canada will be blocked from viewing broadband full-episode content at ABC.com the same way that a Canadian in Canada is blocked; likewise, both Americans and Canadians in the U.S. will be turned away if they attempt to watch full-episode broadband content at most Canadian broadcaster websites. Since this is consistent with the realities of the physical world, it's a logical approach for broadcasters to take and makes a sensible foundation for enforcing territorial licensing agreements – and it preserves the effectiveness of the existing ad-supported model and helps broadcasters avoid disintermediation. As long as the consumer plays along, that is...

## Working around the system – geo-spoofing

Geo-spoofing is the practice of using a third-party service to relay Internet traffic on your behalf. Services abound around the world that will provide this service for you – sometimes at no cost, sometimes for a fee. The net result of relaying traffic through another computer is that the request arrives at its destination (a media site, for example) with an IP address that is not the same as the original one. Sometimes this is done to protect privacy, but often it's done to

make the user appear to be located in a different country than he/she actually is. Services that rely solely on IP address to control access are usually fooled by such approaches. In our testing, we were able, at will, to appear to sites as either coming from Canada or the United States. All major broadcaster broadband streaming sites we tested specifically for geo-blocking (ABC.com, CBC.com, CBS.com, CTV.com, CW.com, Fox.com, GlobalTV.com and NBC.com), and all no-charge content aggregators we tested specifically for geo-blocking (Hulu.com, Veoh.com) appeared to use the IP address as the sole determinant for content access and we were either accepted or turned away depending on the 'nationality' of the IP address we used<sup>4</sup>.

Commercial services exist that enable geo-spoofing, as do informal networks of users who offer their computers as relay points (technically known as proxy servers). While it might be possible to clamp down on commercial services, the *ad hoc* and ever-changing access points created by user communities would be impossible to track and block.

Adding an additional relay step to the process does, however, come at the cost of network speed – sometimes significantly so. Logic would state that the closer the relay point was to either the source or the destination, the lower the impact would be as there would be less distance involved in the redirection but this is not a certainty; it may, however, contribute to the results observed in the following tests. In our test environment, our third-party broadband speed tests were used to determine this impact. With no relay software in use, our speed was typically in the 14 to 15 Mbps (megabits per second) range.

In our tests, one paid proxy subscription service, Anonymizer, lowered our speed test results to about 1.2 Mbps (less than 10% of the original speed<sup>5</sup>). Our traffic appeared to be routed through Delaware.

We also tested using Hotspot Shield, a no-cost ad-supported service that takes the additional step of creating a Virtual Private Network (VPN) to handle the traffic. The product is positioned as a security tool for wireless users of network 'hot spots'. (Note that the Hotspot Shield web page states that this product is currently offered to U.S. residents only but we were able to download, install and use the product from a Canadian IP address. Note also that Hotspot Shield imposes a 10 GB (gigabyte) usage limit per month). Our tests with Hotspot Shield also lowered the speed reported in our bandwidth testing, in this case by about 35%, leaving us with an effective bandwidth rate of about 9.5 Mbps<sup>6</sup>. Our traffic appeared to be routed through California.

To put these numbers in context, the most bandwidth-intensive broadband streaming we were able to measure was the high-definition ABC HD Streaming service at abc.com. High-definition episodes (720p resolution) we tested peaked at about 2 Mbps<sup>7</sup>. This demanding bandwidth application would exceed the capacity we observed with Anonymizer but was well within our observed speed limits using Hotspot Shield. The bandwidth requirement (bitrate) for the same programming was unchanged when accessed without any geo-spoofing software in a test conducted in Chicago, Illinois using a residential Internet connection (see Appendix B: Bandwidth control test). Fox ([www.fox.com/fod](http://www.fox.com/fod)) has streaming

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<sup>4</sup> We were unable to access content at CBS.com using Anonymizer but were successful in doing so using Hotspot Shield. This may well have been an anomaly and should not be used as the basis for drawing any conclusions without further research.

<sup>5</sup> Results may not be typical and varied from test to test. This figure reflects the highest observed test result.

<sup>6</sup> Results may not be typical and varied from test to test. This figure reflects the highest observed test result.

<sup>7</sup> When testing using geo-spoofing, we were only able to obtain this speed on a computer that met ABC's stated minimum hardware specifications.

of one show in high-definition, though the player did not divulge the bitrate. The results were comparable to those observed with the ABC HD Streaming service.

## Geo-spoofing can be damaging to the industry

**NOTE: Although part of the scope of this study, and a very effective tool to allow the simultaneous side-by-side comparison of experiences on both sides of the ‘virtual border’ we needed for this study, we believe that geo-spoofing is harmful to the industry and do not advocate the practice.**

Examining the legalities of geo-spoofing is beyond the scope of this study. Legal questions aside, though, the practice *is* not without negative impact.

For broadcasters who are ‘tricked’ into streaming content, there’s cost associated with that and no benefit. While some will argue that the additional exposure in other markets is good for potential foreign sales of the show, that would only be beneficial to the owners of the show – and in many cases (most if not all cases in Canada) that’s not the broadcaster. In fact, buyers in foreign markets may view the fact that users can get the content online from other countries as a possible deterrent to buying the show.

Broadcasters are working to extend their brands beyond their traditional broadcast boundaries and online content delivery is a powerful way to do that. It’s good for the broadcasters, and it’s good for the consumers. But geo-spoofing undermines the effectiveness of these efforts and represents lost revenue opportunities when a consumer by-passes the domestic rights holder and instead obtains content out-of-market.

Advertisers, too, are adversely affected by geo-spoofing. The bulk of the broadcaster broadband content is free to the consumer, paid for by advertisers. But the advertisers are doing so in order to sell their products in that specific market – products that may well, in fact, be unavailable in the market from which the geo-spoofers are coming.

The resulting impact of wide-spread geo-spoofing could well be an increased reluctance on the part of both broadcasters and advertisers to bring content to the broadband environment – a significant setback for a nascent offering that would otherwise be sure to take off.

## Credit card address verification

Unlike IP address verification, credit card verification is pretty reliable and works very well in cases where a fee is being charged for content access. When a transaction is being done, the user must enter the credit card billing address and it must a) match the records held by the credit card company and b) be within the territory for which the access to content is intended. This approach identifies consumer by their place of residence (with minor exceptions) versus from where they are currently connecting (point-of-access or point-of-presence detection).

While many may willingly offer up their computer as a relay point (proxy server) for IP traffic, they’re certain not to be quick to offer the use of their credit cards.



Some companies, such as Canada’s MovoVivo, use both IP address detection *and* credit card address verification to protect the content rights holders’ interests and to ensure they remain in compliance with their licensing agreements.

The effectiveness of credit card address verification as a strategy is probably limited to those services that involve a commercial transaction since consumers are unlikely to be willing to provide credit card information as a condition of accessing free content.



## Audience measurement

With the increasing variety and number of alternative delivery channels, measuring audiences becomes an ever-increasing challenge. With conventional distribution, it’s relatively easy to measure a program’s popularity within Designated Market Areas (DMAs) and to obtain an aggregate picture at a national level. With alternative distribution, though, new challenges emerge. First, of course, is the need to aggregate data across multiple distribution channels and multiple consumption patterns (streaming, ‘download-to-own’, time-limited downloads, etc.). There’s the additional challenge, though, of identifying where the consumer is located. While IP addresses, as discussed earlier, can give an indication of location, they’re not necessarily reliable even when they’re not falsified. IP addresses can be traced back to the ISP, but the address may only give an indication of where that ISP is headquartered, not specific locations within what may be a vast geographic operation. And, of course, when IP addresses *are* deliberately altered, incorrect and misleading information will be collected.

Sites that require registration occasionally (but not often) ask for the viewer’s location – but even then, there’s no way to verify the accuracy of the information provided.

At this time, while alternative distribution channels represent only a very small portion of total distribution, the impact of vague or inaccurate information is minimal but as time goes by, these channels will play an ever-increasing role in content consumption and the impact of incomplete or poor-quality data may become significant.

There’s an upside, though, that has tremendous potential value to broadcasters and advertisers, though it’s subject to the same potential inaccuracies and misrepresentations discussed above – the ability to collect very detailed information about viewers. Alternative delivery channels have the *potential* to provide a wealth of aggregated information about a consumer that goes far beyond just what they’re watching. Information about *how* viewers watch



the content, and for how long they watch, and how they respond (or don't respond) to particular ads can be of enormous marketing value. These platforms, too, have better abilities than conventional distribution technologies to deliver targeted advertising to the consumer and also to collect, through registration questions (optional or otherwise) a wealth of additional personal and general demographic data.

So, while it may be harder to get accurate numbers about who's watching what content and where they are watching it, it will often be possible to get more detailed and useful information at both the macro and micro level than is available today.

[Note: with the increased use of more-sophisticated set top boxes, the quality and depth of information that can be collected by BDUs is on the rise, too.]

## PART II

# Alternative channels for content delivery

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### Alternative delivery approaches

Alternative delivery approaches really boil down to a few choices. There's streaming and downloading, and those can both be over an Internet broadband connection to a computer or by way of a wireless carrier's network to a mobile device. In this section, we'll examine these.

### On-demand broadcaster broadband streaming

**A note about measurements: content comes and goes on a daily basis from broadcasters' websites at all times. During the study period, this was even more evident as broadcasters not only shuffled their broadband programming but were also doing extensive shuffling of their broadcast programming due to the Writers Guild of America strike.**

Most of the broadcasters we looked at offered consumers some portion of their content as an online on-demand streaming experience – none offered all of their programming online on-demand. While the amount of content offered varied considerably from broadcaster to broadcaster, and from Canada to the U.S., the last two years have seen a steady increase overall in the adoption of this approach.

Broadband streaming is expensive, but costs are dropping. Encoding efficiency (i.e. better compression) is improving, and broadcasters are moving to more efficient streaming formats.

In addition to the normal-sized player image, most sites offer the ability to view a larger version of the image (and/or full screen) but this is almost always a stretched version of the smaller image (that is, the player zooms content by stretching it to match the new dimensions, not by switching to a feed that is of actual higher resolution). In all cases, the smaller-sized version was better suited to the bitrate used for the streamed image and the quality suffered at larger sizes.

While some players seem designed with a lean-forward computer-based viewing experience in mind, others seem designed to more closely approximate the conventional lean-back TV viewing experience. A simple differentiator between these two approaches can be found in the full-screen (or maximum-sized) experience available. If web advertising and browser controls disappear – it's conducive to a relaxed, lean-back experience. If not, the experience remains one that is aligned to the computer-usage paradigm and won't deliver that relaxed, lean-back experience even if delivered on a big-screen TV in the living room. Of course, how the user wants to consume the content has a lot to do with what the player should deliver – and the best players accommodate both scenarios well, though these are few and

far between (though the Joost player is a very good example) and the viewer must often make a trade-off between what they want and what the specific player being used can deliver.

Almost all online streaming content was delivered at no cost to the viewer. The content was usually sponsored by advertisers and usually the amount of ad content was significantly less than is found in conventional broadcasting. Quite common, too, was the practice of having an entire program sponsored by a single advertiser – a throw-back to the days of single-sponsor television programs like The Colgate Comedy Hour (debuted in 1950) or Kraft Television Theatre (debuted in 1947). Indeed, like in those days, the sponsors all tended to be big multi-national corporations including, for example, Intel, Nissan, Toyota, and American Express as well as big-budget movies. These corporations have the dollars available to experiment with advertising on new distribution channels and their national prominence ensures that their ads are at least somewhat relevant to the entire (legitimate) viewing audience. While technology can, and someday will, deliver ads targeted down to the level of the individual viewer, it's not worth the time and money today to do so due to the small number of viewers.

Some subscription services exist, and we may see this take an upturn over time. Unless more effective controls can be introduced to preserve traditional market boundaries than today's attempts at geo-blocking, advertisers may grow weary of paying to deliver content to an unknown (and unknowable) audience. As well, if subscription services can deliver the content the consumers want at an effective price point, consumers may prove quite willing to pay for all of their content on a subscription or *a la carte* basis and forego conventional delivery altogether.

## Select broadcaster websites (United States; English-language)

### *The 'big three'*

The big-three U.S. television networks (ABC, NBC and CBS) all offered roughly the same percentage of their evening content online, and the online content spanned all genres. Like these television networks themselves, there's something available online for everyone, but everything someone might want isn't available as these networks put only roughly 50-60% of their content online.

These television networks make some of their non-primetime content available online, too, but as the Canadian ratings don't generally reflect a very high level of interest in this content it was not analyzed.

### *Fox and The CW*

Both Fox and The CW are primetime-centric in their programming and deliver much less other content than the 'big three' networks. Perhaps because they have less other programming to deal with, these two networks have a greater percentage of their content available online. Another reason for this may be their target audience demographic: both networks target younger viewers, and these younger viewers are more likely to be tech-savvy and to want to use alternative delivery channels for content consumption.

## *PBS*

PBS was a bit different from the other American broadcasters we examined. While there is a main video page at the pbs.org website, upon drilling down into content we were redirected to program pages that presented us with a dizzying array of different content players, providing inconsistent and varying experiences. PBS has a vast amount of content available but the experience itself varies so widely from show to show that it defies categorization.

## Select broadcaster websites (Canada; English-language)

### *CTV*

CTV was a bit of an anomaly in that they really have numerous different web video portals, but two are of principal interest: one for news-related programming and the other for primetime programming – and while the quality within each was consistent there was a noticeable difference in the quality between the two.

With respect to primetime programming, a moving target throughout the study period, we estimate that approximately 25% of CTV's main network primetime programming is also available for full-episode streaming on the Internet.

CTV primetime programming was geo-blocked, allowing access only to Canadian IP addresses.

CTV also offers paid broadband simulcast services for some of its specialty services (see Live streaming – broadband simulcast).

For primetime programming, the CTV player provides a normal mode and a full-screen mode. In full-screen mode, the player zooms (stretches the image) to the full screen resolution. There's no 'in-between' size, but if the screen resolution is 800x600, the image is very watchable. Beyond that, the quality suffers. The player retained the 4:3 image aspect ratio of content regardless of the aspect ratio of the computer screen. On a 27" CRT television set, connected via S-Video cable to a computer, the experience was almost on a par with watching a standard-definition TV broadcast on the same device. The technology behind the player could not be identified, nor would the player disclose the technical properties of the content.

The CTV News web video portal uses Windows Media Player and, like the primetime site, it offers standard and full-screen modes only, again zooming (stretching the image). This player does disclose the technical attributes of the content and these varied depending on the program as can be seen in the table below:

**Properties**

File | Content | Playlist

View advanced details about the selected item.

Length: 11:52  
 Bit rate: 716 Kbps  
 Media type: Video  
 Video size: 416 x 312  
 Aspect Ratio: 4:3  
 Audio codec: Windows Media Audio 9.2  
 96 kbps, 44 kHz, stereo (A/V) 1-pass CBR  
 Video codec: Windows Media Video 9  
 Location: http://ad.ca.doubleclick.net/adx/video.ctv/WFiv  
 e;arena=video;feed=live;sz=1x1;spd=h;ord=1  
 201264653750.aspx

OK Cancel Apply

**Statistics**

Basic | Advanced

Media  
 Maximum bit rate: 716.8 Kbps  
 Selected bit rate: 716.8 Kbps

Connection  
 Bandwidth available: > 3500.0 Kbps  
 Bandwidth in use: 0.0 Kbps  
 Protocol: CACHE

Video  
 Frames skipped: 24  
 Frame rate: 29 fps  
 Actual rate: 29.9 fps

Packets  
 Received: 0  
 Recovered: 0  
 Lost: 0

Quality (15s average): 100 %

Close

**Technical properties of a recent W-Five segment (CTV News video portal)**

**Properties**

File | Content | Playlist

View advanced details about the selected item.

Length: 11:07  
 Bit rate: 500 Kbps  
 Media type: Video  
 Video size: 416 x 312  
 Aspect Ratio: 4:3  
 Audio codec: Windows Media Audio 9  
 48 kbps, 44 kHz, mono (A/V) 1-pass CBR  
 Video codec: Windows Media Video 9  
 Location: http://ad.ca.doubleclick.net/adx/video.ctv/Elev  
 enP;arena=video;feed=live;sz=1x1;spd=h;ord  
 =1201265339514.aspx

OK Cancel Apply

**Statistics**

Basic | Advanced

Media  
 Maximum bit rate: 500.0 Kbps  
 Selected bit rate: 500.0 Kbps

Connection  
 Bandwidth available: > 3500.0 Kbps  
 Bandwidth in use: 2526.9 Kbps  
 Protocol: HTTP

Video  
 Frames skipped: 4  
 Frame rate: 30 fps  
 Actual rate: 29.9 fps

Packets  
 Received: 3431  
 Recovered: 0  
 Lost: 0

Quality (15s average): 100 %

Close

**Technical properties of CTV National News (CTV News video portal)  
 (note: lower bitrate is noticeable in playback quality)**

**Properties**

File Content Playlist

View advanced details about the selected item.

Length: 16:58  
 Bit rate: 600 Kbps  
 Media type: -  
 Video size: 416 x 312  
 Aspect Ratio: 4:3  
 Audio codec: Windows Media Audio 9.1  
 96 kbps, 44 kHz, stereo 1-pass CBR  
 Video codec: Windows Media Video 9  
 Location: http://esi.ctv.ca/datafeed/urlgen2.aspx?vid=28047

OK Cancel Apply

**Statistics**

Basic Advanced

**Media**  
 Maximum bit rate: 600.0 Kbps  
 Selected bit rate: 600.0 Kbps

**Connection**  
 Bandwidth available: > 3500.0 Kbps  
 Bandwidth in use: 3046.4 Kbps  
 Protocol: RTSP (TCP)

**Video**  
 Frames skipped: 0  
 Frame rate: 24 fps  
 Actual rate: 23.9 fps

**Packets**  
 Received: 1642  
 Recovered: 0  
 Lost: 0

Quality (15s average):  100 % Close

**Technical properties of The Verdict (CTV News video portal)**  
 (note lower frame rate... the news crawl at the bottom of screen is noticeably jerky during playback as a result)

## CBC

CBC, Canada's public broadcaster, hosts a wealth of particularly archival content, at the [cbc.ca](http://cbc.ca) website. because they've been in the broadband video game variety of formats and players. CBC seems to have Windows Media Player for newer content, but even of variation in the quality and resolution of the

Sheer volume of available content (and, therefore, streaming bandwidth required) may explain why tends to be of lower resolution than other There were too many variations to record but specifications for The Hour (shown) are reasonably recent content.

The video player used at the CBC's French-counterpart, Radio-Canada<sup>8</sup> is different. Though embedded Windows Media Player, the French detachable.

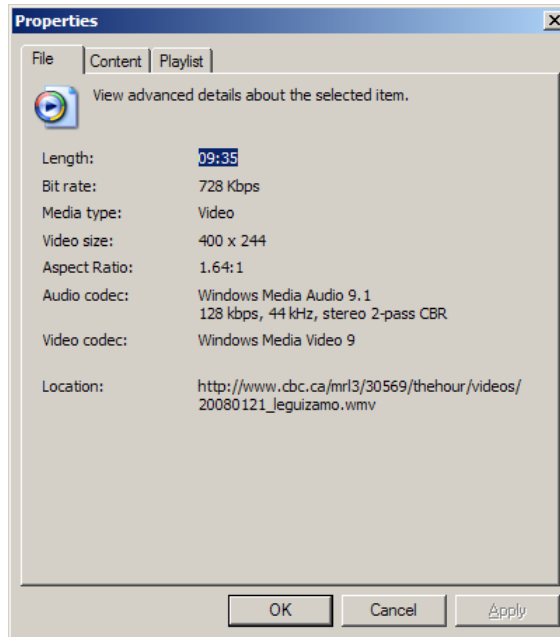
For more on the CBC, see [Case study: Hockey Night in Canada](#)

## Global TV

Global's 'full episodes' video page listed six programs at the time we initially examined it. Later, a seventh program, The Guard, was added. Unfortunately, not all the programs listed were actually available. For example, no full episodes of Heroes were available, due to the WGA strike in all likelihood (though behind-the-scenes clips were available). As well, no episodes (or clips) of Global Currents were available. The most recent episode of Focus Ontario was available, as were episodes of the homegrown program, da Kink In My Hair.

Global appears to use a standardized Flash-based player for all content. The player did not make technical specs available. The content was available in two sizes but there was no full-screen option. As with almost all players we encountered, the large size is merely a zoomed (stretched) version of the same feed. Subjective analysis would indicate a low frame rate for X-Treme sports segments (video with rapid motion – in the example we examined, skiing) is a good test of broadband quality. Significant artefacts were observed when the player was enlarged, though these were less noticeable in the smaller playback mode.

<sup>8</sup> Although its name may cause confusion, Radio-Canada (or more formally, La Société Radio-Canada), is the French-language public broadcaster and is both a radio and a television broadcaster. Radio-Canada also operates Réseau de l'information (RDI), a French-language news specialty service.



content, CBC, perhaps so long, had a standardized on then there's a lot digital content.

a lot of CBC content broadcasters. technical representative of

language both sites use an version is



da Kink In My Hair (standard size: 400x300)



da Kink In My Hair (enlarged: ~662x496)

da Kink In My Hair was tested for geo-blocking. Newer episodes of da Kink In My Hair appeared to be limited to Canadian IP addresses, although there was no message to that effect – the video simply did not play when accessed from a U.S. IP address. Some of the earlier episodes (all are season one episodes – the current season) were clearly not geo-blocked.

### **E!**

Like Global TV, E! is part of the Canwest media empire. It offers full episodes online of some of its reality and game shows: Final 24, 1vs100, Deal or No Deal and 5<sup>th</sup> Grader – all U.S. productions. There is no full-length Canadian content. There are many clips from other programs at the site.

### ***The former Alliance Atlantis channels***

The goliath of Canadian specialty services, and now also part of the Canwest empire, the former Alliance Atlantis encompasses 21 channels that offer online video content to varying degrees.

At one end of the spectrum is Showcase, offering full episodes of a variety of shows including both current Canadian productions (or co-productions) such as Trailer Park Boys, Kenny vs. Spenny and The L Word, and past productions (Queer as Folk). The site also offers full episodes of the U.S.-produced Weeds. Showcase.ca also has a small amount of exclusive web content and a shorts showcase.

While the video quality delivered is by no means remarkable, the content selection is.



Food Network Canada offers a variety of clips and full episodes of seven programs, including Restaurant Makeover and Food Jammers, while HGTV has full episodes of Sarah's House, Holmes on Homes, Colin and Justin's Home Heist, Debbie Travis' Facelift, Buy Me and Big City broker. It has a lot of other clips and (including two that are identified as web-exclusive clips). Like Showcase, the video quality isn't anything to get excited about.

At the other end of the spectrum, The National Geographic Channel Canada had no video content<sup>9</sup>.

Overall, these channels offer viewers a vast amount of Canadian content.

### ***MuchMusic and MTV Canada***

MuchMusic and MTV Canada, both CTV Globemedia properties, have a wealth of video content available on their websites, much of it original programming and, therefore, Canadian programming.

[Content is also available on all three major Canadian mobile networks]

### ***Business News Network (BNN)***

BNN, a CTV Globemedia specialty service, makes a wide variety of its programming available on-demand at its main webpage and its video portal website (broadband.bnn.ca).

In addition, it offers live streaming as a premium subscription service.

Given its focus on Canadian business, BNN online provides a wealth of Canadian content.

[Note: BNN content is also available on the Bell Mobility network.]

### ***S-Vox***

Despite its small size, even specialty-service broadcaster S-Vox has begun distributing content on alternative channels.

Vision TV has a surprisingly large amount of video content available at its recently launched Vision TV On Demand website, although it is mostly clips and promos. We found one 45-minute program. The player is quite small at 320x180 and, unlike most, is not resizable.

We found a small amount of video content for S-Vox's *One* channel but none for *The Christian Channel*, although perhaps now that Vision TV has launched its On Demand service we will see something similar for these stations.

It is encouraging to see that even smaller specialty services are adopting broadband as a distribution method.

---

<sup>9</sup> Links at the page reached by selecting the "Interactive" tab, under the heading Videos, labeled 'High-Resolution' and 'Low-Resolution' launched Windows Media Player but produced file-not-found errors and displayed no content. There was no indication of what the video content was meant to be.

## Select broadcaster websites (Canada; French-language)

### TVA

We found no video content at the main TVA website (tva.canoe.ca). Many shows are available on-demand on Vidéotron cable (both TVA and Vidéotron are properties owned by Quebecor Media).

Simulcasting of specialty services ARGENT and LCN is available.


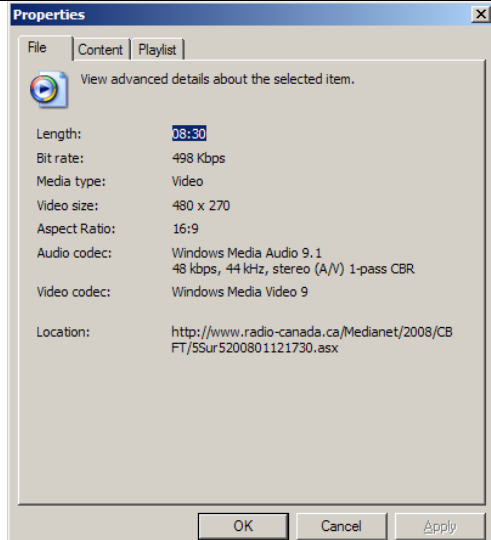
### TQS

Many talk shows and some news programming are available online, but we could find no scripted dramatic programming. Over 1300 clips are available from the reality program Loft Story, though it is not currently on the schedule. All video content is probably 100% Canadian content.

### SRC

SRC offers live simulcasting of both Réseau de l'information (RDI), and the main Radio-Canada signal. There is some web-only content, and a lot of broadcast programming is available online.

*While French-language broadband on-demand content was less available than English-language programming, live simulcasting was much more prevalent than among English-language broadcasters.*

|  |  |
|--|--|
|  |  |
| Live streaming from Radio-Canada.ca is pictured above                              | Technical characteristics of Radio-Canada streaming                                  |

## Non-broadcaster aggregators of broadcast content

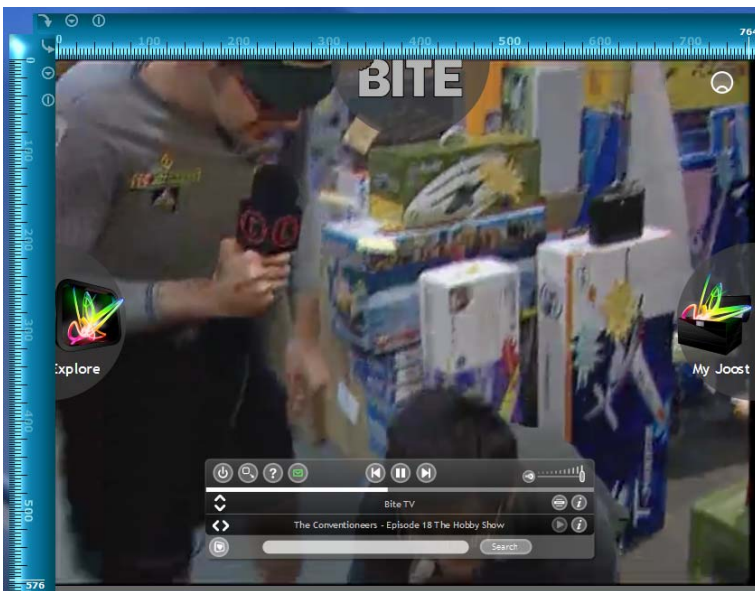
### Joost

Joost uses IP geo-locating to determine where a viewer is located, and different content choices are presented to users from different countries to reflect licensing agreements.

Joost uses a resizable player that scales better than most; it uses a higher-resolution signal than most broadband streaming to begin with, and perhaps does better interpolation as well, as shown below:



Joost at ~500 x 326.



Joost at ~764 x 576.



Joost at @ ~1200 x 925 with controls hidden

Joost strives to emulate the standard viewing experience by adopting the very-familiar traditional TV channel-up-channel-down paradigm, but there's also added functionality in the form of widgets and chat capabilities that the user can partake in or not as they choose. Content providers can extend the experience through use of the programmable widget toolkit.

Unlike services like YouTube, Joost only accepts content from professional content producers with whom it has made deals, so there's no low-quality user-generated content here.

Examining both the U.S. and Canadian versions of Joost, we found no conventional-broadcaster Canadian content, nor any U.S. content that's high in the ratings in Canada. We did find content from some Canadian specialty services. For BiteTV and MuchMusic, the content was available in both the U.S. and Canada.

What distinguishes Joost from other services is that it relies on peer-to-peer (P2P) technology to achieve cost-efficient distribution to a very-wide audience base. P2P works on the basis of distributing small bits of the content far and wide on users machines such that when a viewer requires the next bit of content, the viewer's computer actually retrieves the content from another Joost user's computer rather than from a centralized server (or even an array of geographically distributed servers as is the case with Content Delivery Networks (CDNs)). P2P-based distribution efficiency actually *improves* as the number of viewers *increases*, the exact opposite of most alternative distribution approaches. Even conventional distribution approaches don't enjoy an economy of scale the way P2P distribution does – whether over-the-air, via cable, telco-IPTV or satellite, the cost and efficiency of delivering specific content to 1,000 viewers or 1,000,000 viewers remains the same.

## *Hulu*

For now, during its current beta test phase, access to Hulu is by invitation only, and registration is required. It is geo-blocked to allow U.S. IP addresses only. It does offer a lot of primetime content to Americans, often by redirecting the viewer to the original broadcaster's website. With Fox and NBC as major backers (NBC pulled all of their content from iTunes and has made some available on Hulu) this service is poised to become a major force, and will likely lead the way for streaming aggregators (and, perhaps, eventually, download sales) when it comes to U.S. primetime content.

## *JumpTV*

Jump TV, a Canadian-based service, bills itself as "the world's largest broadcaster of international and sports content over the Internet." The diverse array of foreign content may have significant appeal to Canada's diverse ethnic composition. We found no Canadian or U.S. channels.

## *canoe.tv*

The recently launched Canadian canoe.tv service offers a mix of domestic and international channels through live simulcasting as well as recorded content. It embeds some content from JumpTV.

It's still early days for canoe.tv, and content is sparse, but its Canadian heritage could be a real boon for Canadian viewers. The featured program throughout January 2008 was Jozi-H, a CBC / South African co-production. Full episodes are available, branded as CBC content and showing the CBC bug, but, interestingly, we couldn't find the same content on CBC's own website.

## *YouTube*

Canadian content is well represented on You Tube with clips and/or full episodes of Corner Gas, CTV News, Little Mosque on the Prairie, The Rick Mercer Report, Breakfast Television and more.

## *Case study: Veoh*

Unlike the previously examined non-broadcaster aggregators of broadcast content, Veoh has a foot in two camps: it offers content through legitimate agreements with broadcasters including NBC, CBS and PBS, while it also allows users to post their own content. Examples of broadcaster content, and the difference in availability for U.S. and Canadian viewers, are shown below.

Broadcaster content at Veoh

Log in | Register | Support | Family Filter: On

veoh Videos TV Shows Channels People Search Videos Publish

### New - Watch Your Favorite TV Shows with Veoh

Full-length episodes and clips, full-screen viewing, always on your schedule. Veoh now brings you your Favorite TV Shows as well as the best original Web Series all in one place.

TV Shows on Veoh TV Shows Web Series

Show All 0-9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Sort Order: Alphabetical List View Detail View

1-100 of 199 TV Shows

|                                    |            |                                |            |
|------------------------------------|------------|--------------------------------|------------|
| Til Death                          | CLIPS ONLY | Conviction                     |            |
| 24                                 |            | Cops                           |            |
| 30 Rock                            |            | Cover Me                       |            |
| 48 Hours Mystery                   | CLIPS ONLY | Criminal Minds                 | CLIPS ONLY |
| 60 Minutes                         | CLIPS ONLY | The Crow: Stairway To Heaven   |            |
| The A-Team                         |            | CSI: Crime Scene Investigation |            |
| Adam-12                            |            | CSI: Miami                     |            |
| Age of Love                        | CLIPS ONLY | CSI: NY                        |            |
| Airwolf                            |            | Damages                        |            |
| Alfred Hitchcock Hour              |            | Days of our Lives              | CLIPS ONLY |
| Alfred Hitchcock Presents          |            | Death Sentence                 | CLIPS ONLY |
| Alias Smith And Jones              |            | Decision House                 |            |
| The Amazing Race                   | CLIPS ONLY | Dexter                         | CLIPS ONLY |
| American Dad!                      |            | Doogie Howser, M.D.            |            |
| American Gladiators                |            | Dr. 90210                      | CLIPS ONLY |
| American Gothic                    |            | Dr. Steve-O                    |            |
| Andy Barker P.I.                   |            | Dragnet                        |            |
| Are You Smarter Than A 5th Grader? |            | Dream On                       |            |

InternetVue™ IV-2020  
2008 CES Innovations Honoree  
Click here for a special offer for Veoh.com visitors!

FEATURED PARTNERS

- CBS**  
Watch full-length episodes of "CSI," "Moonlight," "Big Bang Theory" and more CBS shows.
- TV Guide**  
Catch up with the hottest stars and go behind the scenes of your favorite shows.
- Next New Networks**  
Cartoons from Channel Frederator, fresh car news from Fast Lane Daily and lots more.
- LX-TV: W Scene**  
W Scene showcases art, culture and entertainment destinations from around the country.

Partial list of TV shows available on Veoh U.S. site accessed via U.S. IP address

Log in | Register | Support | Family Filter: On

veoh Videos TV Shows Channels People Search Channels Publish

### New - Watch the best, original Web Series with Veoh

Watch the hottest original Internet productions and discover new favorites with Veoh. Veoh now brings you the best original Web Series all in one place.

Web Series on Veoh Web Series

Show All 0-9 A B C D E F G H I J K L M N O P Q R S T U V W X Y Z

Sort Order: Alphabetical List View Detail View

1-21 of 21 Web Series

|                            |                              |
|----------------------------|------------------------------|
| Ask A Ninja                | Indy Mogul                   |
| Baeble Music               | KushTV - Digital Underground |
| Barely Political           | KushTV - The Loc Dog Show    |
| BigCatRescuers             | LX TV Escapes                |
| Cube News 1                | Pulp Secret                  |
| Danny Bonaduce: Life Coach | ThreadBanger                 |
| Ego TV                     | VernissageTV                 |
| EPIC-FU                    | W Scene                      |
| Fast Lane Daily            | Wallstrip                    |
| Ford Models Media          | Who What Wear TV             |
| Garage419                  |                              |

1-21 of 21 Web Series

Catch the shows you know from Prime Time TV

veohTV  
FREE DOWNLOAD  
Experience Internet Television

FEATURED PARTNERS

- CBS**  
Watch full-length episodes of "CSI," "Moonlight," "Big Bang Theory" and more CBS shows.
- TV Guide**  
Catch up with the hottest stars and go behind the scenes of your favorite shows.
- Next New Networks**  
Cartoons from Channel Frederator, fresh car news from Fast Lane Daily and lots more.
- LX-TV: W Scene**  
W Scene showcases art, culture and entertainment destinations from around the country.

No TV shows available on Veoh U.S. site via Canadian IP address








Log in | Register | Support | Family Filter: On

veoh Videos TV Shows Channels People Search Videos Publish

**24**  
 Follow Jack Bauer (Kiefer Sutherland) as he battles terrorists. "24" takes place in a single day, with each of the 24 episodes covering a single hour in real time.  
 Updated: 19 hours ago  
 Videos: 176  
 Viewable: US Only

Full Episodes Clips  
 Season 6 Sort Order Episode - Newest

|   |   |  |
|---|---|--|
|  | <b>10:00 A.M. - 11:00 A.M.</b><br>Episode: 5<br>CTU learns there are four more nuclear threats to contend with and, in a strange turn of events, the trail Jack follows leads him right to his brother.   | Aired: 01/22/2007<br>Views: 1434<br>Source: hulu.com |
|  | <b>9:00 A.M. - 10:00 A.M.</b><br>Episode: 4<br>The fight against terror continues when Jack has to deal with both Curtis and a nuclear threat. The team raids a warehouse in search of answers and the unthinkable happens.                     | Aired: 01/15/2007<br>Views: 531<br>Source: hulu.com  |
|  | <b>8:00 A.M. - 9:00 A.M.</b><br>Episode: 3<br>Jack and former terrorist leader Amri Al-Assad overcome differences and unite to track a suspicious man to a storage facility in Los Angeles.   | Aired: 01/15/2007<br>Views: 442<br>Source: hulu.com  |
|  | <b>7:00 A.M. - 8:00 A.M.</b><br>Episode: 2<br>20 months after last season's shocking season finale, Jack Bauer joins with an unlikely ally in an effort to stop a suicide bomber and uncover who is behind the terrorist strike on Los Angeles. | Aired: 01/14/2007<br>Views: 490<br>Source: hulu.com  |
|  | <b>6:00 A.M. - 7:00 A.M.</b><br>Episode: 1<br>New U.S. President Wayne Palmer, brother of the late President David Palmer, has negotiated Jack's release  | Aired: 01/14/2007<br>Views: 1195<br>Source: hulu.com |

View the demo.  
Start here

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Ordinary people come to grips with their extraordinary powers.
- The Simpsons**  
Follow the adventures of Homer, Marge, Bart, Lisa and Maggie.
- Wallstrip**  
Where pop culture meets stock culture. Watch daily episodes with host Lindsay Campbell.

Full episodes of 24 are available via a U.S. IP address

Log in | Register | Support | Family Filter: On

veoh Videos TV Shows Channels People Search Videos Publish

**24**  
 Follow Jack Bauer (Kiefer Sutherland) as he battles terrorists. "24" takes place in a single day, with each of the 24 episodes covering a single hour in real time.  
 Updated: 19 hours ago  
 Videos: 176  
 Viewable: US Only

Full Episodes Clips  
 Sort Order Episode - Newest

This TV Show has no full episodes.

Catch the shows you know from Prime Time TV  
 veohTV  
 FREE DOWNLOAD  
 Experience Internet Television

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Grissom and his teams of forensic scientists try to crack the toughest crimes.
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Follow the adventures of Homer, Marge, Bart, Lisa and Maggie.
- Wallstrip**  
Where pop culture meets stock culture. Watch daily episodes with host Lindsay Campbell.

Enter your email to get featured videos in your inbox:  Submit

No full episodes of 24 available via a Canadian IP address

As we said, Veoh also allows users to post content – the intent being that they post *user-generated content*. However, by allowing user posting, Veoh also ends up playing host to what may be infringing content:

### Full episodes of Degrassi: The Next Generation at Veoh



**Degrassi: "Standing in the Dark, pt. 1"**  
Disclaimer- Video is ONLY intended for ENTERTAINMENT purposes. I Do Not Own Degrassi or it's affiliates. Season 7 Premiere. Starring... Shenae Grimes, Cassie Steele, Jamie Johnston Darcy...  
21 min 22 sec      Added: 2 months ago      Category: [Movies & TV](#)  
By:      Source: [Veoh.com](#)



**Country of Origin:** Canada  
**Audio Language:** English  
**Subtitle Language:** N/A  
disorder, an embarrassed Liberty is ashamed to sessions. Emma sees one of Liberty's private  
22 min 39 sec      Added: 7 months ago      Category: [Movies & TV](#)  
By:      Source: [Veoh.com](#)



**Country of Origin:** Lithuania  
**Audio Language:** English  
**Subtitle Language:** N/A  
month ago      Category: [Movies & TV](#)  
by:      source: [veoh.com](#)

Standing in the dark pt. 1 + pt. 2

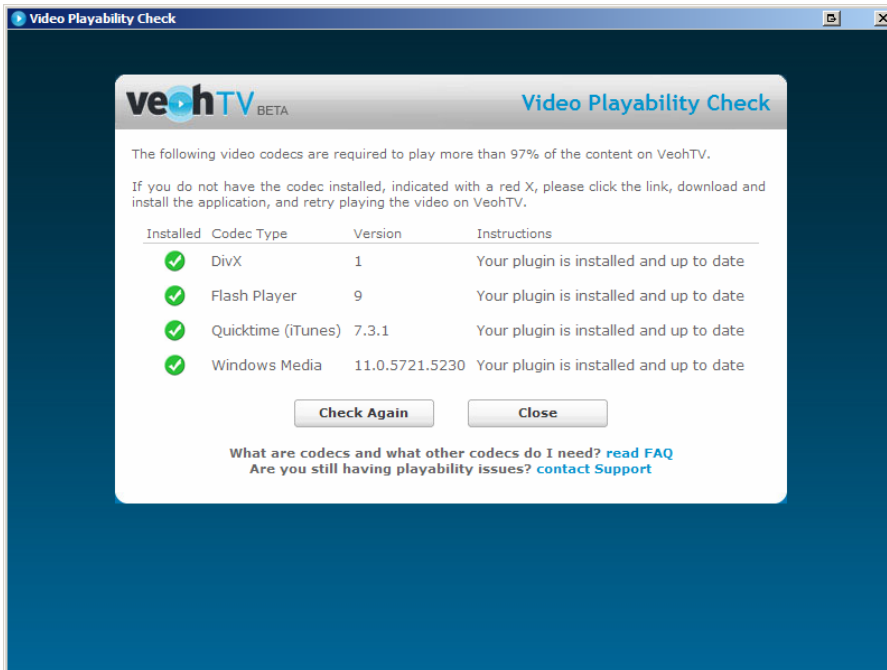
Veoh is a supporter of the *Principles for User Generated Content Services*<sup>10</sup>, so it's clear that they discourage infringing content, but the reality of trying to police such activity is another matter (although *Principles for User Generated Content Services* makes an interesting read on the subject of content identification technology).

### The VeohTV Player

Veoh can play content in an embedded browser window but Veoh also offers the stand-alone VeohTV player that can deal with content encoded in many formats:

<sup>10</sup> See <http://www.ugcprinciples.com/>





The VeohTV player provides a satisfactory full-screen experience on a 27" CRT (@ nominal 800x600 resolution via S-Video) and on a 19" LCD monitor at 1280x1024 resolution, provided the viewer sits at a conventional television-viewing distance ( $\geq 4$  feet). The player can scale to even larger dimensions, although quality naturally deteriorates and some artifacts are noticeable.



VeohTV at maximum resolution on 24" LDC @ 1920x1080 via digital connection



eohtv @ 1280 x 1024 on 19" LCD analogue monitor



VeohTV player in full-screen mode @ 800x600 on 27" CRT TV set via S-Video connection with player controls exposed



VeohTV player in full-screen mode @ 800x600 on 27" CRT via S-Video connection with controls auto-hidden

A very nice feature is that the player can be programmed for unattended content downloading for subsequent viewing, and a time window for such downloading may be specified.

### **Live streaming – broadband simulcast**

Broadcasters have begun experimenting with live streaming – simulcasting of their broadcast signal – over the Internet and, in some cases, to mobile devices. TVA does live Internet streaming of their signal for selected programs on their main stations and some of TVA's specialty channels do Internet simulcasting of all programming (for example, LCN and ARGENT). TVA's Shopping TVA channel also does Internet simulcasting on TVA's canoe.tv website though in our observations the two signals were carrying different content or were significantly out of synch.

TVA's Internet simulcasting uses Windows Media Player at 320x240 (4:3) resolution, streaming at 331 Kbps and delivering 30 FPS. The window can be enlarged to full screen but the image quality suffers. It is watchable on a conventional TV connected to a computer at a typical TV viewing distance, though the quality is clearly not as good as a standard definition broadcast. The same content watched on a computer monitor at typical computer-usage distance is very inferior to a standard TV experience. At standard (320x240) size, the image is reasonable, though, of course, small – and the higher the resolution of the monitor, the smaller the image is.

CBC is doing live Internet broadcasting of Hockey Night in Canada, but, at 320x240, it, too, suffers from the same issues, though with a bitrate of 272Kbps versus TVA's 331 Kbps, the image quality is poorer, and this is made worse by full-screen viewing.

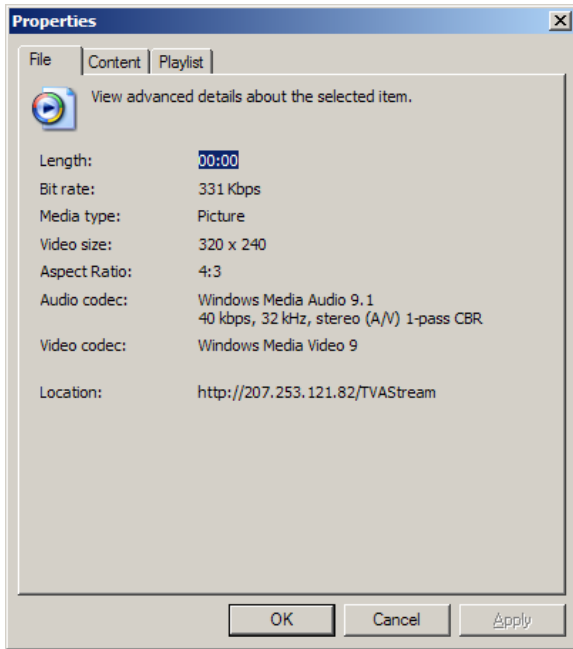
SRC has simulcasting of both Réseau de l'information (RDI) and basic Radio-Canada TV programming.

CTV.ca offers users unlimited Internet viewing access to CTV Newsnet Live Stream news channel, "through a Live, High Speed Video Stream on a subscription basis for \$6.95 a month. A low speed, live video stream of Newsnet is available for \$4.95 a month." Live streaming of BNN ("BNN Live Stream") is also available.

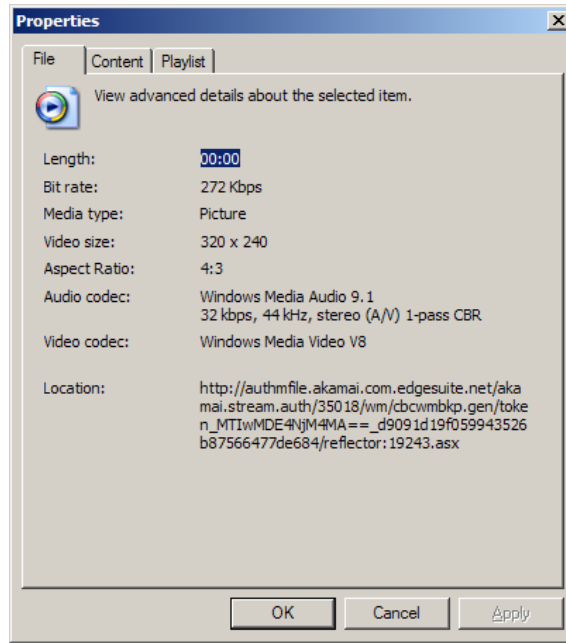
CBS News makes the CBS Evening News available via Internet simulcast within the United States. The image is of standard-definition resolution. Non-U.S. viewers can watch news from previous days but not access the simulcast.

HBO has announced a limited trial in the U.S. (certain areas in Wisconsin to be more precise) that will include an on-demand streaming service AND a live broadband simulcast of its east coast feed – but it will be limited to subscribers of its premium broadcast channel (a tricky task, discussed in more detail in the section entitled *Conventional broadcasters compared to specialty services*).

Within Canada it was interesting to note that there's much more simulcasting of French-language programming than there is for English-language programming. Not only is more simulcast content available to French-language audiences, it is all available at no cost, whereas arguably comparable content is only available as a subscription simulcast service for English Canada (e.g. ARGENT versus BNN and LCN versus CTV Newsnet).



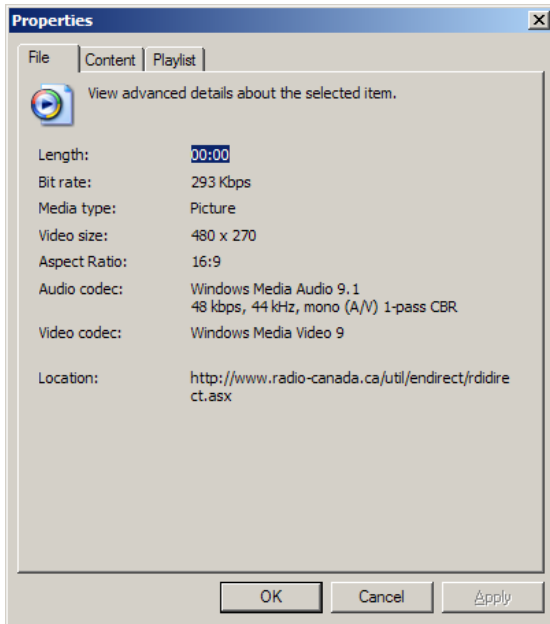
TVA simulcast properties



CBC Hockey Night in Canada simulcast properties

Since simulcasting (as has been implemented in these examples) does not permit video ‘scrubbing’ or ‘trick play’ (that is, the ability to pause or fast forward/rewind the content) this approach lends itself well to the use of a multicasting distribution model to reduce costs. As well, since the multicasting approach can significantly reduce costs, a much-better quality image could be delivered than what we’re seeing in these examples.

Radio-Canada, on the other hand, does some live streaming of Réseau de l'information (RDI) with a 480x720 resolution in 16:9 aspect ratio at 293 Kbps. Viewed on a 27" CRT TV, via an S-Video connection to a PC, and compared with the same program delivered by cable, the quality of the broadband image was noticeably less than that of the cable image in terms of both brightness and detail. However, the program was certainly watchable in this manner. It is interesting to note, perhaps, that the broadband feed does not include the news crawl and time/stock index information that is shown at the bottom of the cable feed.



### Advertising in simulcast programming

CBC's Hockey Night in Canada does not include any advertising (the player stops for the duration of the on-air ads). TVA's simulcasting includes what appear to be the same ads as the broadcast program. In the case of Réseau de l'information (RDI), the same advertising was found in both the broadband and cable streams. The cable stream switched to a 4:3 aspect ratio for some ads while the broadband feed remained in 16:9 and was letterboxed on our test device, creating a distorted image.

Simulcasting over the Internet is an opportunity for targeted advertising insertion, though there was no indication that this is being done at this time by anyone. At this point in time, simulcasting is hard to find. It has potential for growth as an efficient way for broadcasters to distribute content over the Internet, and it can address some of the place-shifting and device-shifting needs of viewers. It is not a solution for time-shifting requirements however unless a store-for-later-viewing component is added.

### Mobile Content

#### On-deck

Canada's mobile carriers all offer similar content in similar ways. The three major carriers all provide some streaming channels through MobiTv and offer downloadable content through QuickPlay. None offer the high-rated primetime broadcast content that is the main focus of this study.

Mobile subscriber numbers are still quite low, but are growing. Mobile networks are improving, and screens are getting a bit bigger.

One provider told us that the services are making a small operating profit – as long as the capital expenditure required to enable the service offerings isn't taken into account. That operator also indicated that they're putting much more focus on streaming services going forward and will de-emphasize and eventually discontinue downloading services. Battery life is still a major issue, though, and it will be a while yet before viewers can consume much content on a cell phone or other cellular-network device without plugging in to recharge.

### Off-deck

Increasingly, consumers are going 'off deck' to look for content. Indeed, according to an executive at one Canadian carrier to whom we spoke, the traditional 'walled garden' of the mobile world is on its way out.

We looked to see how broadcasters are dealing directly with the mobile public. We couldn't find made-for-mobile websites for the major private Canadian broadcasters, and the CBC mobile site was oriented to non-video news content, as was the case for its French-language counterpart, Société Radio-Canada (SRC). NBC, however, seems to have embraced the off-deck mobile TV fan... though with limited content.

The screen shots below give an indication of what's out there, including full episodes of Coastal Dreams which, although we weren't able to get them working, didn't appear to be geo-blocked, unlike their counterparts on NBC's normal website.



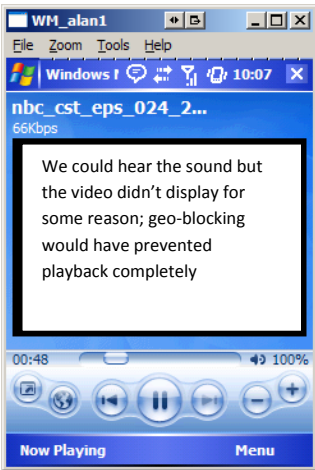
m.nbc.com main menu



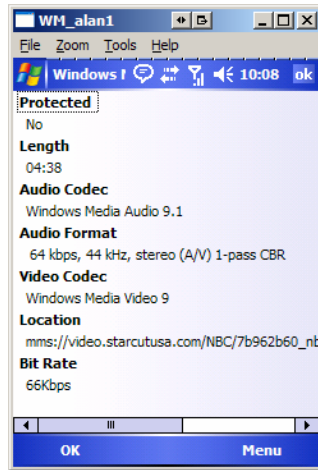
My Name is Earl menu



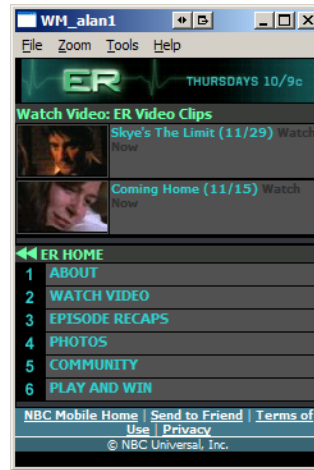
Coast Dreams full episodes menu



Coastal Dreams episode



Coastal Dreams episode specs



ER; clips but no full episodes

## Online Sales

### iTunes

Though Apple's iTunes has recently launched TV sales in Canada, comparing the Canadian and U.S. TV offerings is like comparing apples and oranges – they are that different in content availability. In Canada, very limited content is available while the U.S. site has extensive content.


IP geo-identification is used to steer you to a specific store but access to other iTunes stores is not blocked. HOWEVER, a valid credit card with a mailing address in the store-specific country must be provided to purchase content. Therefore, unlike most of the geographically determined content options that exist, this is based not on perceived location but perceived place of residence. Unlike broadcasters' websites, for example, where a Canadian currently using a computer in the U.S. has access to the content, with iTunes a typical Canadian currently in the U.S. doesn't have access to content – even free content – without a U.S.-issued credit card associated with a U.S. address.



Top 10 episodes at iTunes Canadian store  
(2008 01 21)

Top 10 episodes at iTunes U.S. store  
(2008 01 21)

TOP TV EPISODES

1.  **Guitar Queer-O**  
South Park
2. **The List**  
South Park
3. **Dane Cook**  
Comedy Central Stand-Up
4. **Imaginationland Episode III**  
South Park
5. **Imaginationland**  
South Park
6. **Imaginationland Episode II**  
South Park
7. **Standing In the Dark, Pt. 1**  
Degrassi: The Next Generation
8. **Make Love, Not Warcraft**  
South Park
9. **Cartman S\*\*\*s**  
South Park
10. **Le Petit Tourette**  
South Park

TOP TV EPISODES

1.  **McStroke**  
Family Guy
2. **Gnothi Seauton**  
Terminator: The Sarah...
3. **The Thin Line Bet...**  
Gossip Girl
4. **Lois Kills Stewie**  
Family Guy
5. **Stewie Kills Lois**  
Family Guy
6. **Goodbye, Zoey**  
Zoey 101
7. **Bye Bye Ball**  
Hannah Montana
8. **Guitar Queer-O**  
South Park
9. **The Mortal Cure**  
Moonlight
10. **Lay Your Hand On Me**  
Grey's Anatomy

### *iTunes and Canadian content*

While iTunes Canada has only a small amount of television content available (regardless of country of origin), one Canadian show is available at both the U.S. iTunes store and the Canadian iTunes store: Degrassi: The Next Generation. At \$1.99 per episode at both stores, and approximate U.S.-Canadian dollar parity, the pricing is equal, but that's as far as the equality goes. At the U.S. store, the full first 6 seasons and the first 6 episodes of season 7 are available<sup>11</sup>; in contrast, the Canadian store only offers the full sixth season and the first episode of season 7. [NOTE: it appears that the U.S. broadcasting schedule is ahead of the Canadian broadcasting schedule and that in both cases, despite the apparent disparity, iTunes does offer the latest episode from the current season as it relates to the broadcast schedule for the particular country]

<sup>11</sup> Observations for both the Canadian and U.S. iTunes store availability were conducted at the same time on January 21, 2008.

The Tudors, a Canadian co-production, is available at the U.S. iTunes store but is not available at the Canadian store. Most Canadian consumers can't shop at the U.S. iTunes store as a credit card with a U.S. billing address is required.

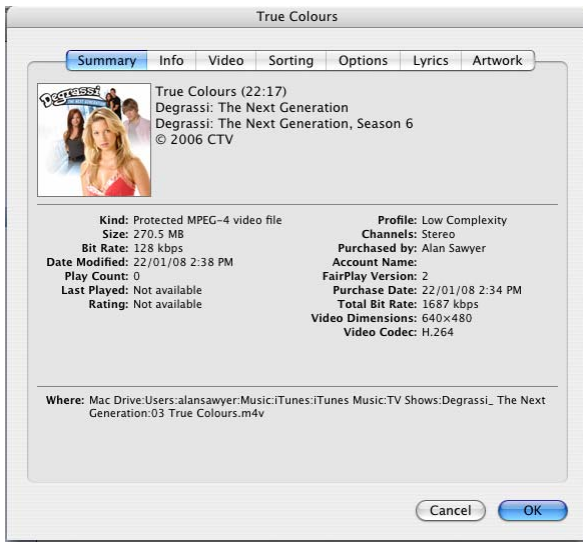
| Name        | Time  | Show       | Description                                    | Price                |
|-------------|-------|------------|--|----------------------|
| 1 Episode 1 | 55:57 | The Tudors | In the series premiere, Henry prepares for ... | \$1.99 (BUY EPISODE) |
| 2 Episode 2 | 57:04 | The Tudors | Henry contemplates an alliance with Holo Do    | \$1.99 (BUY EPISODE) |

**iTunes and U.S. content**

Although the pricing was again the same, the availability of the U.S. show South Park was notably different between the two stores. While American consumers had access to 11 seasons, the Canadian store offered only the three most recent seasons.

**iTunes technical details**

As seen below, iTunes does a better job than most in disclosing the technical details of the content although the digital rights management (DRM) details aren't spelled out.



An interesting note, below, illustrates Apple's policies concerning cross-border traffic<sup>12</sup>.

#### U.S. SALES ONLY

Purchases from the iTunes Store are available only in the United States and are not available in any other location. You agree not to use or attempt to use the service from outside of the available territory. Apple may use technologies to verify such compliance.

Gifts purchased from the iTunes Store in the United States may be purchased only for, and redeemed only by, residents of the United States. Gifts are non-refundable. Gifts may not be purchased with iTunes Cards, Gift Certificates or Allowance Accounts.

#### Amazon Unbox

Amazon Unbox won't sell content to Canadians, nor could we find any Canadian content available on the service.

Unbox uses both IP address identification and credit card billing address as filters. As a result, only American residents who are in the United States (or at least using a U.S. IP address) at the time they attempt to make a purchase will be successful.

<sup>12</sup> From <http://www.apple.com/legal/itunes/us/sales.html>

### Important things to know about Amazon Unbox™

- **You must be in the US when you download Unbox videos.** You can only download Unbox videos while you're in the United States, even if you're a US citizen overseas. Sorry!
- **Windows XP SP2 or Windows Vista is required (unless you're downloading to a TiVo).** You'll need to install the Amazon Unbox Video Player to download Unbox videos on your PC. The video player runs on Windows Vista and Windows XP with Service Pack 2 (including Windows Media Center Edition). It does not run on Mac OS or Linux. If you're downloading to a Series2 or Series3 TiVo box, then Windows isn't required.
- **All Unbox transactions are 1-Click.** From here on in, it's just click and download (sometimes you'll need to re-enter your Amazon account information). We'll charge your default credit card automatically.

Complete purchase Cancel

Unbox offers a greater choice of formats than other on-line content sales sites that we examined, as illustrated below (for an episode of CSI):

### Video Download Details

| Computer   | TiVo box   | Portable device   |
|--|--|---|
| <p>⌋ STEREO ⌋</p> <p>WIDESCREEN</p> <p>Episode ready to watch in about 20 minutes*</p> | <p>⌋ STEREO ⌋</p> <p>File Size 880.0 MB<br/>Bitrate 2500 kbps<br/>Aspect Ratio 1.76:1<br/>Audio Channels 2</p> | <p>⌋ STEREO ⌋</p> <p>WIDESCREEN</p> <p>Episode ready to transfer in about 20 minutes*</p> |

\* Your download times may vary--estimates shown are for a typical DSL connection (1.5 Mbits/sec)

### Video Download Details

| Computer   | TiVo box   | Portable device   |
|--|--|---|
| <p>⌋ STEREO ⌋</p> <p>WIDESCREEN</p> <p>Episode ready to watch in about 20 minutes*</p> | <p>⌋ STEREO ⌋</p> <p>LETTERBOX</p> <p>Episode ready to watch in about 1 hour 25 minutes*</p> | <p>File Size 978.0 MB<br/>Bitrate 2800 kbps<br/>Aspect Ratio 1.33:1<br/>Audio Channels 2</p> <p>* Ready to watch in about 10 minutes on TiVoHD and TiVo Series3 boxes with progressive download</p> |

\* Your download times may vary--estimates shown are for a typical DSL connection (1.5 Mbits/sec)

## Video Download Details



\* Your download times may vary--estimates shown are for a typical DSL connection (1.5 Mb/s)

### MoboVivo

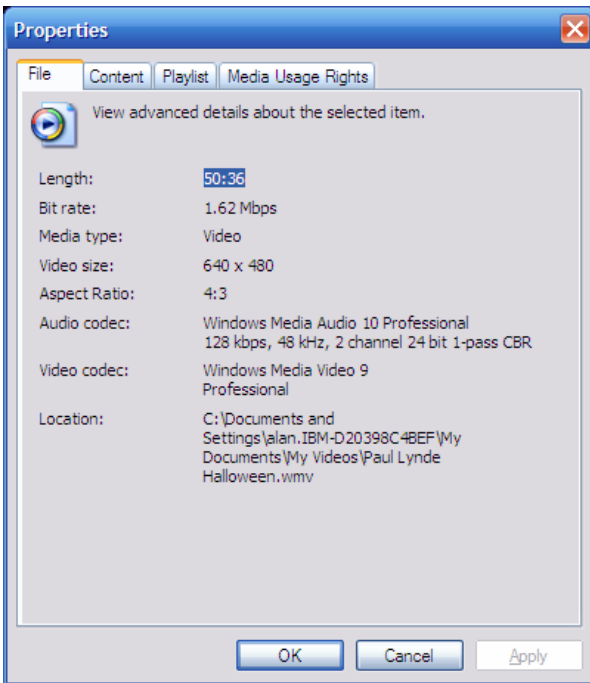
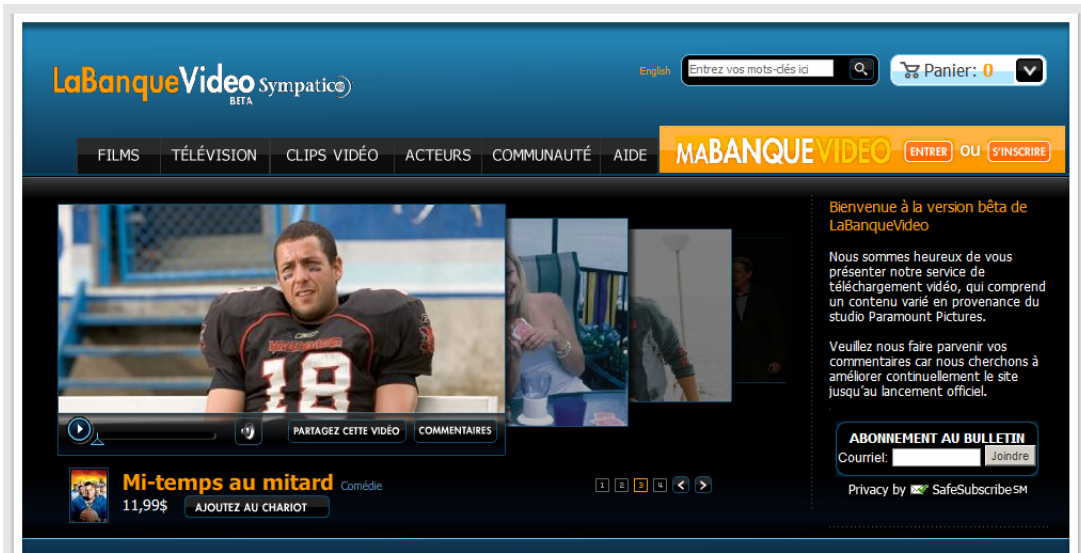
MoboVivo is a Canadian company that sells content – mostly short form – primarily for download, via computer, to portable devices (a process known as side-loading). Wireless carriers offer similar capabilities but currently those services are limited (or at least heavily skewed) to their own subscriber base. MoboVivo is a network- and service-subscription-independent retailer of *a la carte* content (not unlike the new kid in town, iTunes Canada's TV store).

### Bell Video Store

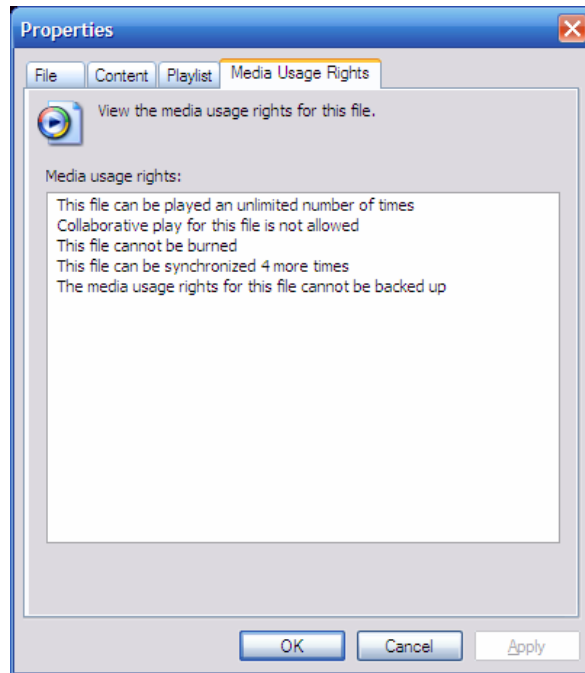
Although it launched in May 2007, the Bell Video Store (and its French-language counterpart LaBanqueVideo Sympatico, with French-language content – albeit extremely limited at the moment) is still in beta testing mode and, therefore, the experience is still quite buggy. As a Canadian service, and one that addresses the francophone audience with French-language content though, it's definitely one to keep an eye on. As it stands now, there's no sign of contemporary primetime content, but there is some long-tail content (e.g. an extensive list of black-and-white episodes of The Dick Van Dyke Show).

Like many download services (including iTunes), this service requires users to install a combined player/library manager on their computers. The Bell player itself requires Windows XP/Vista (no Mac support, apparently) and Windows Media Player version 10 or higher.

Registration is required to buy content, and the process demanded more personalized information than most, including gender and date of birth (ostensibly required in case a password reset may be needed).



Technical specs of a downloaded program



Digital rights management for the program


## Broadcaster-direct

### *Treehouse Direct*

Few broadcasters sell downloadable content directly to the public, but Corus Entertainment’s Treehouse TV is an exception. Their Treehouse Direct service offers content from 15 English-language programs and 2 French-language programs.

The usage rights are controlled by Windows Media’s Digital Rights Management system. The content can be watched an unlimited number of times. It can’t be moved from one computer to another but can be synchronized with other devices up to 3 times.

### This is Emily Yeung Learning about Paramedics



[Preview](#)  
[Email a Friend](#)  
[Add to Cart](#)

Purchase to own: \$1.49

**Released:**  
**Starring:** [Emily Yeung](#)  
**Director(s):** [Mark Bishop](#), [Matt Bishop](#), [Matt Hornburg](#), [James Johnson](#), [Blair Powers](#)  
**Genre:**

Emily Yeung is learning what Paramedics do in our communities

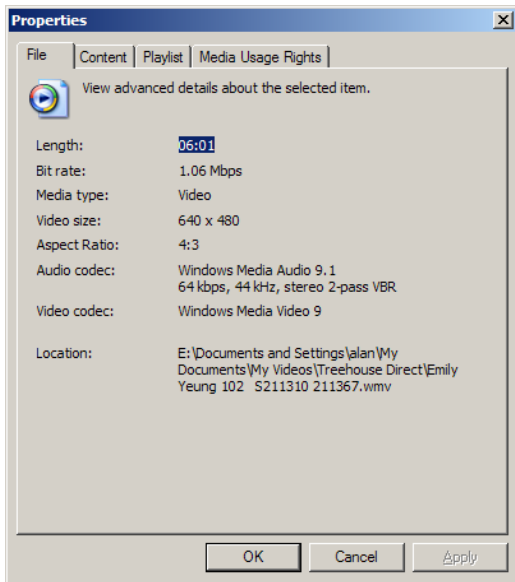
---

|                     |                       |
|---------------------|-----------------------|
| Studio:             | Treehouse             |
| Rating:             | TV-Y (TV)<br>G (MPAA) |
| Run Time:           | 6:00                  |
| Language:           | English               |
| Screen Format:      | standard              |
| File Size:          | 47.0 MB               |
| Est. Download Time: | 0.1 hours             |

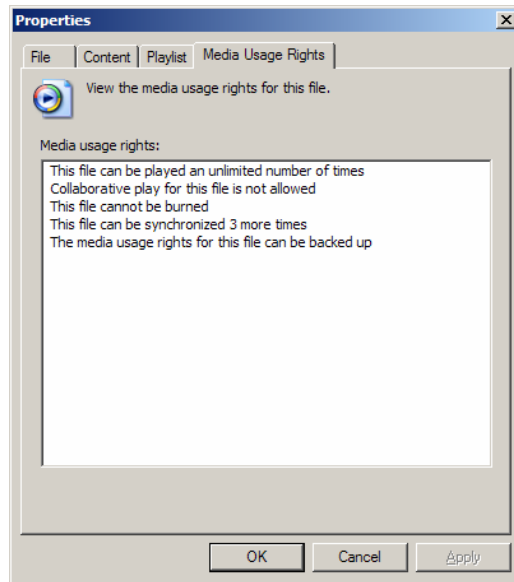
The pre-purchase information provides limited detail regarding the technical specifications, but does not explicitly state resolution (it’s 640x480) – and does not detail the Digital Rights Management policies.

The service is intended exclusively for Canadian consumers, as outlined in the terms and conditions, and the entire Treehouse Direct site uses geo-blocking, allowing only Canadian IP addresses.

Once a purchase transaction is completed, the content download to the user’s computer occurs in the background; in our test, that took about 5 minutes.



Technical specs for a purchased program



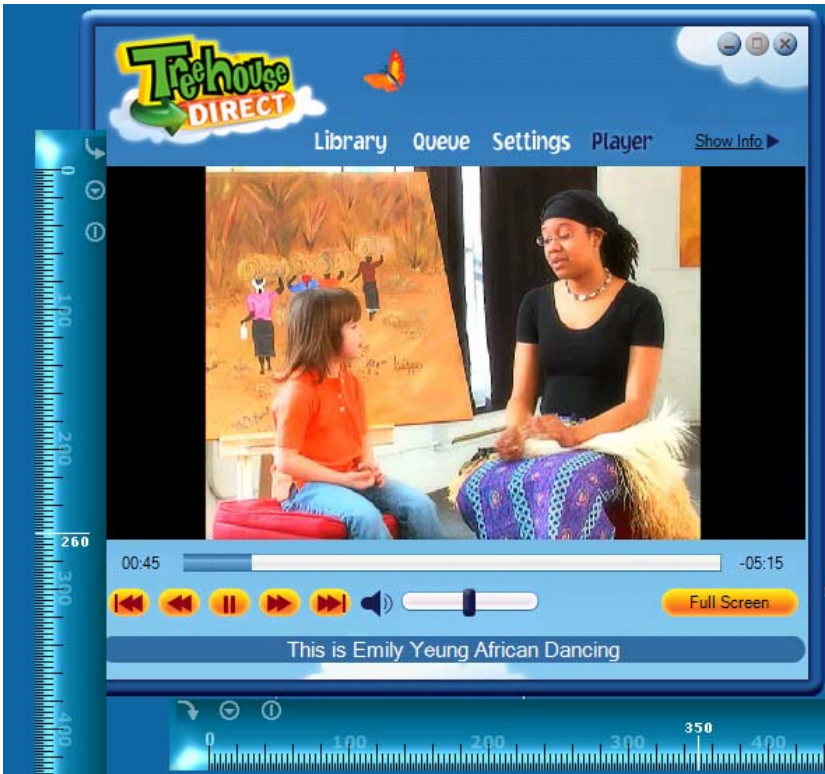
Digital rights management for the program

Since the native resolution is equal to that of standard-definition television, clearly the content would look good on a standard TV set.

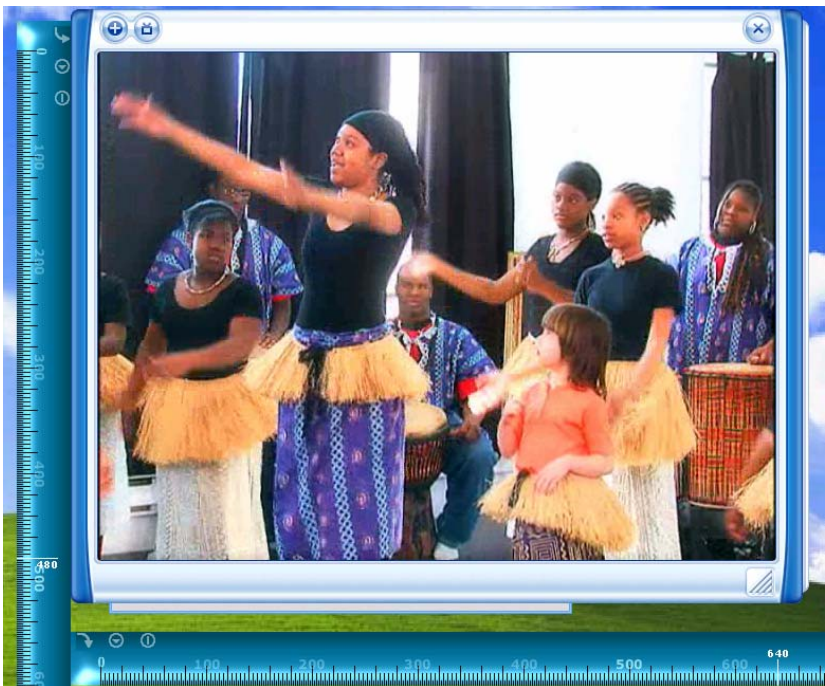
The Treehouse Direct player (a mandatory download) displays the content at 350x260 resolution. This was well below the 'native' (or actual encoded) resolution of the content we tested (640x480 – normal standard-definition TV resolution). The player does have a 'full screen' button, but this player, like many players, stretches the image to fill the entire screen at whatever screen resolution is set. As 800x600 is a common *minimum* screen resolution on computers today, there is no way for most to watch the content with this player at the optimum resolution – that is, the resolution for which it was specifically encoded.

However, since the content is in Windows Media format, it can also be played using Windows Media Player, which is fully resizable, allowing an optimal viewing experience.





Content viewed using normal resolution of Treehouse Direct's player (i.e. 350x260).



Content viewed at native (i.e. 640x480) resolution using Windows Media Player

## Torrents (BitTorrent protocol)

Torrents use the BitTorrent protocol to allow consumers to download large video files (or other content) by way of peer-to-peer (P2P) network file sharing. Video content is broken into a great number of pieces. These pieces are acquired by the receiving computer a piece at a time from other 'peer' computers that have the required piece. In turn, the receiving computer helps share the content by providing needed pieces to other peers. For a more detailed explanation, see <http://en.wikipedia.org/wiki/.torrent> at Wikipedia.

What's important to understand for our study is that the technology itself is an efficient and effective way of distributing video content. It is particularly popular for the distribution of unlicensed content and, in this regard, the technology has acquired a bad name – but it's not the technology that's to blame, it's those who use it in that way. There are legal, licensed uses of torrents, although the illegal usage far outweighs the legal usage at this time.

### Licensed torrent-based distribution

BitTorrent.com is an example of one company that (now) deals exclusively in licensed torrents, selling content licenses to consumers. Like most alternative content sources, though, Canadians are blocked from buying American studio-produced content.

Azureus Vues is another example of a licensed provider of content that uses the peer-to-peer torrent protocol for distribution. Again, though, Canadians aren't allowed to buy the content that they are most likely to want. The Vues software component that resides on a user's computer, though, doesn't discriminate between licensed and unlicensed content; it can be used to download any torrent file.

### Unlicensed content

As mentioned above, there's huge 'underground' traffic in unlicensed content and the black market doesn't differentiate between consumers based on their location. Sadly, much of the time, this approach represents *the only* alternative distribution technology available to Canadians (unless they resort to geo-spoofing to alter their IP address, itself at the very least a 'gray market' activity).

Legal action is common against operators of torrent sites but the practice continues unabated. Indeed, the question of the legality of what these operators do is a murky one as they themselves don't distribute any content; they merely tell users the identity of others users who can provide the various pieces needed to assemble the content.





















The content that is available has usually been digitized from a broadcast signal or lifted from a DVD. Torrents of popular shows are available in a wide variety of formats (for example, Windows Media, DivX, AVI, and QuickTime) and resolutions (ranging from low cell-phone friendly versions to 1080p high-definition versions).

The following illustrations show that Canadian programming is also widely available in this manner:

## Search results for *holmes on homes* (20 torrents)

Search in category:

All **Featured** Anime Books Games Movies Music Pictures Software TV Shows Other

| Added     | Category | Name   | Size      | Seeds | Leechers |
|-----------|----------|--|-----------|-------|----------|
| 08 Dec 07 | TV Shows |  <a href="#">HolmesOnHomes s06e13 ThirdTimeLucky</a> [fr333dom.com]   | 597.93 MB | 3     | 1        |
| 28 Nov 07 | TV Shows |  <a href="#">HolmesOnHomes s07e01 HitTheDeck</a> xvid avi [fr333dom.com]  | 597.61 MB | 3     | 4        |
| 25 Nov 07 | TV Shows |  <a href="#">HolmesOnHomes s07e02 RockyReno</a> [fr333dom.com]  | 597.44 MB | 2     | 4        |
| 24 Nov 07 | TV Shows |  <a href="#">HolmesOnHomes s06e12 CountryKitchen</a> xvid avi   | 597.51 MB | 3     | 3        |
| 25 Oct 07 | TV Shows |  <a href="#">Holmes On Homes Season 3</a> Complete  | 5.59 GB   | 4     | 32       |
| 20 Jun 07 | TV Shows |  <a href="#">Holmes on Homes s06 Lack of Truss</a>  | 568.98 MB | 1     | 4        |
| 17 Jun 07 | TV Shows |  <a href="#">Holmes on Homes series 3 Holmes for the Holidays x-Demonoid</a> com-x 1175741 189                        | 680.81 MB | 1     | 2        |
| 24 Apr 07 | Movies   |  <a href="#">Holmes On Homes Season 4</a> Complete (xvid 2 pass)  | 7.77 GB   | 2     | 33       |
| 06 Apr 07 | TV Shows |  <a href="#">Holmes On Homes Season 1</a> Complete  | 4.36 GB   | 9     | 28       |
| 27 Mar 07 | TV Shows |  <a href="#">Holmes On Homes Season 2</a>   | 4 GB      | 9     | 15       |
| 11 Dec 06 | TV Shows |  <a href="#">Holmes on Homes s06e03</a> Completely Incomplete   | 573.47 MB | 1     | 1        |
| 05 Dec 06 | TV Shows |  <a href="#">Holmes on Homes s05</a> Showing the Cracks   | 569.4 MB  | 1     | 2        |
| 04 Dec 06 | TV Shows |  <a href="#">Holmes on Homes Season 4</a> (2006)[(4)4 5GiG DvD's]{Video Files}{FS}menu and extras[ENG]{AC3}-SiNGE     | 16.47 GB  | 1     | 7        |
| 28 Nov 06 | Anime    |  <a href="#">Holmes on Homes s06 Lets Rejoist</a>   | 454.51 MB | 1     | 8        |
| 17 Nov 06 | TV Shows |  <a href="#">Holmes on Homes s06 Shaky Foundation</a>   | 478.73 MB | 1     | 3        |
| 15 Nov 06 | TV Shows |  <a href="#">-Demonoid com- Holmes on Homes s04 Bar None</a> 1175741 189  | 449.49 MB | 1     | 2        |
| 12 Nov 06 | TV Shows |  <a href="#">Holmes on Homes s05 - What a Mesh</a>  | 469.62 MB | 1     | 2        |
| 08 Nov 06 | TV Shows |  <a href="#">Holmes on Homes s05 - Wall of Sound</a>  | 478.59 MB | 1     | 5        |
| 07 Nov 06 | TV Shows |  <a href="#">Holmes on Homes - season 5 - Holmes inspection</a> part 1 and 2  | 948.89 MB | 1     | 3        |
| 24 May 06 | TV Shows |  <a href="#">Holmes on Homes Season 3</a> (2006)[(2)4 5GiG DvD's]{Video Files}{FS} with menu and extras[ENG]{AC3}-SiN | 8.73 GB   | 1     | 8        |

## Search results for *rick mercer report* (8 torrents)

Search in category:





























All **Featured** Anime Books Games Movies Music Pictures Software TV Shows Other

| Added     | Category | Name  | Size      | Seeds | Leechers |
|-----------|----------|---|-----------|-------|----------|
| 05 Dec 07 | TV Shows |  <a href="#">Rick Mercer Report 5x08 PDTV XviD-CCCP</a> [www.torrentzilla.org]             | 174.38 MB | 1     | 2        |
| 22 Nov 07 | TV Shows |  <a href="#">[TT] Rick Mercer Report - S05E07 - PDTV XviD CCCP</a>                         | 174.36 MB | 2     | 1        |
| 04 Oct 07 | TV Shows |  <a href="#">The Rick Mercer Report S05E01</a> HDTV XviD-MiNT[www.torrentsforall.net]      | 180.09 MB | 3     | 2        |
| 03 Oct 07 | TV Shows |  <a href="#">[TT] The Rick Mercer Report - S05E01 - HDTV XviD MiNT</a>                     | 174.7 MB  | 1     | 1        |
| 03 Oct 07 | TV Shows |  <a href="#">The Rick Mercer Report S05E01</a> HDTV XviD-MiNT [www.thepeerhub.com]         | 180.09 MB | 0     | 0        |
| 22 Feb 07 | TV Shows |  <a href="#">Rick Mercer Report - S04E15 - February 20, 2007</a> (Canada's Jon Stewart)    | 174.24 MB | 1     | 1        |
| 21 Feb 07 | TV Shows |  <a href="#">Rick Mercer Report - S04E14 - February 13, 2007</a> [digitaldistractions] avi | 174.05 MB | 2     | 1        |
| 08 Feb 07 | TV Shows |  <a href="#">[TT] Rick Mercer Report - S04E13 - February 6 2007</a>                      | 174.2 MB  | 0     | 0        |

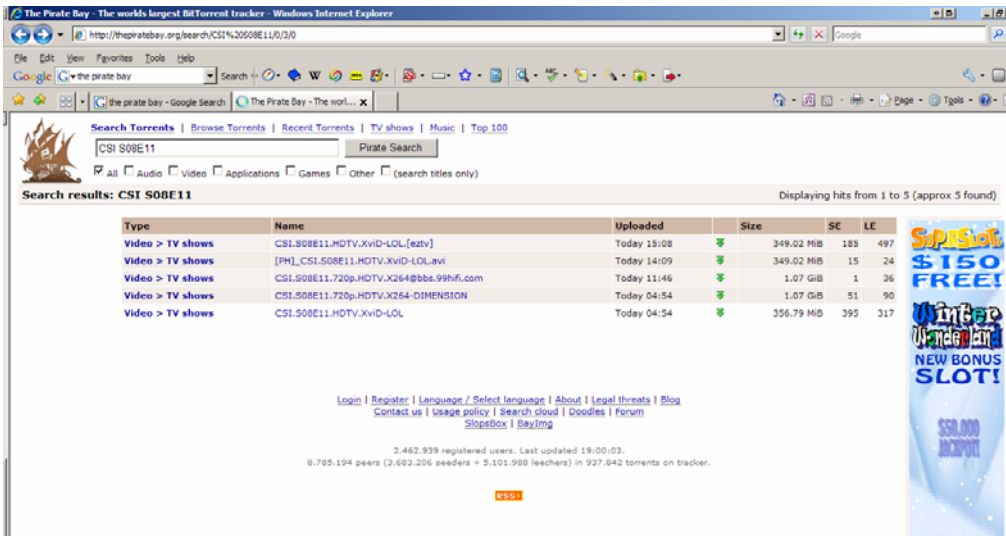
## Search results for *little mosque on the prairie* (59 torrents)

Search in category:

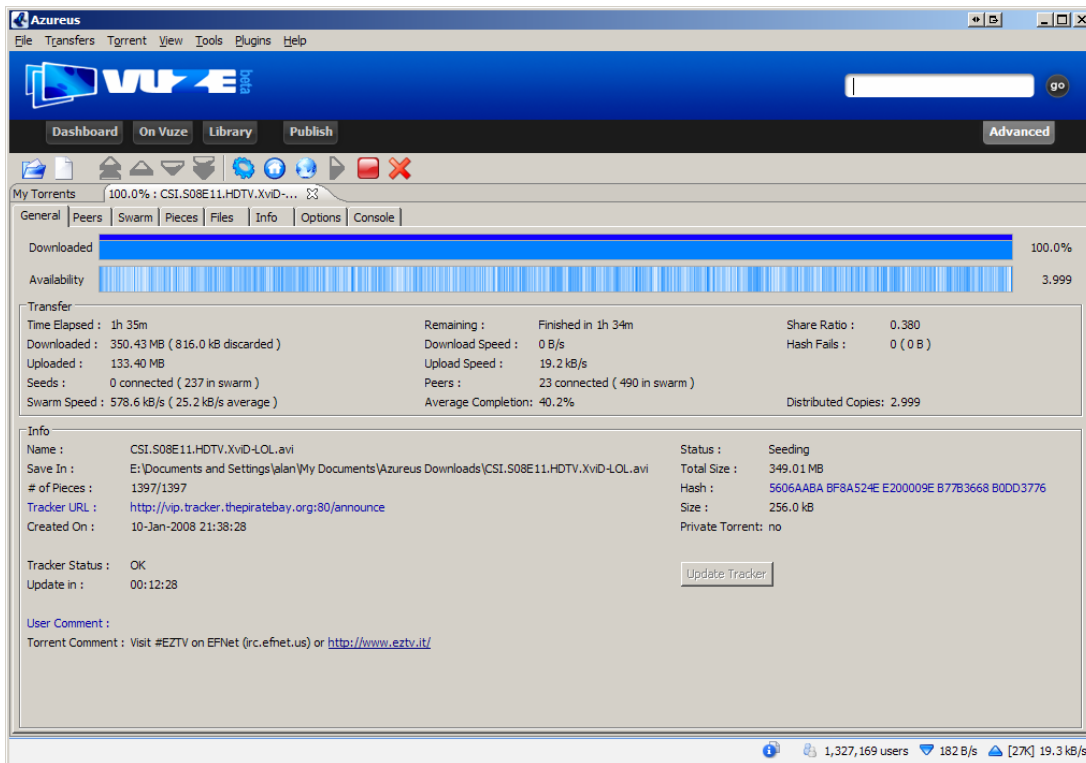
All **Featured** Anime Books Games Movies Music Pictures Software TV Shows Other

| Added     | Category | Name   | Size      | Seeds | Leechers |
|-----------|----------|--|-----------|-------|----------|
| 13 Dec 07 | TV Shows |  <a href="#">SceneLeech.org_Little.Mosque.on.the.Prairie.S02E10.HDTV.XviD-2HD</a>           | 183.15 MB | 1     | 1        |
| 13 Dec 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E10</a> HDTV XviD-2HD [eztv]                   | 175.27 MB | 45    | 5        |
| 06 Dec 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E09</a> HDTV XviD-2HD [eztv]                   | 175.27 MB | 19    | 10       |
| 29 Nov 07 | TV Shows |  <a href="#">[TT] Little Mosque on the Prairie - S02E08 - HDTV XviD NODLABS</a>             | 175.25 MB | 1     | 1        |
| 29 Nov 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E08</a> HDTV XviD-NODLABS [eztv]               | 175.25 MB | 22    | 11       |
| 22 Nov 07 | TV Shows |  <a href="#">[TT] Little Mosque on the Prairie - S02E07 - HDTV XviD NODLABS</a>             | 174.57 MB | 1     | 1        |
| 22 Nov 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E07</a> HDTV XviD-NODLABS [eztv]               | 174.57 MB | 22    | 6        |
| 15 Nov 07 | TV Shows |  <a href="#">[TT] Little Mosque on the Prairie - S02E06 - HDTV XviD 2HD</a>                 | 175.03 MB | 1     | 0        |
| 15 Nov 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E06</a> HDTV XviD-2HD [eztv]                   | 175.02 MB | 16    | 14       |
| 15 Nov 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E06</a> HDTV XviD-2HD[www.torrentsforall.net]  | 182.02 MB | 7     | 2        |
| 15 Nov 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E06</a> HDTV XviD-2HD [www.thepeerhub.com]     | 182.02 MB | 2     | 1        |
| 08 Nov 07 | TV Shows |  <a href="#">[TT] Little Mosque on the Prairie - S02E05 - HDTV XviD 2HD</a>                 | 175.28 MB | 2     | 1        |
| 08 Nov 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E05</a> HDTV XviD-2HD [eztv]                   | 175.27 MB | 18    | 8        |
| 27 Oct 07 | TV Shows |  <a href="#">[TT] Little Mosque on The Prairie - S02E03 - Ban the Burka - hq xvid AKIRA</a> | 234.14 MB | 2     | 1        |
| 26 Oct 07 | TV Shows |  <a href="#">Little Mosque On The Prairie S02E03</a> Ban the Burka hq xvid AKIRA avi        | 234.13 MB | 20    | 16       |
| 25 Oct 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E04</a> HDTV XviD-2HD [eztv]                   | 174.03 MB | 14    | 8        |
| 25 Oct 07 | TV Shows |  <a href="#">[TT] Little Mosque on the Prairie - S02E04 - HDTV XviD 2HD</a>                 | 174.04 MB | 3     | 1        |
| 15 Oct 07 | TV Shows |  <a href="#">[TT] Little Mosque on the Prairie - S02E02 - Public Access</a>                 | 175.45 MB | 1     | 1        |
| 14 Oct 07 | TV Shows |  <a href="#">Little Mosque on the Prairie - S02E02 - Public Access</a>                      | 175.45 MB | 20    | 11       |
| 10 Oct 07 | TV Shows |  <a href="#">Little Mosque on the Prairie 201 HD Vostfr</a> avi                             | 169.99 MB | 1     | 1        |
| 10 Oct 07 | TV Shows |  <a href="#">Little Mosque on the Prairie 201 HD Vostfr</a> avi                             | 169.99 MB | 1     | 2        |
| 04 Oct 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E01</a> HDTV XviD-2HD [eztv]                   | 174.61 MB | 10    | 4        |
| 04 Oct 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S02E01</a> HDTV XviD-2HD                          | 183.96 MB | 10    | 8        |
| 04 Oct 07 | TV Shows |  <a href="#">[TT] Little Mosque on the Prairie - S02E01 - HDTV XviD 2HD</a>                 | 174.62 MB | 1     | 1        |
| 26 Apr 07 | TV Shows |  <a href="#">Little Mosque on the Prairie Season 1</a>                                      | 1.38 GB   | 6     | 4        |
| 17 Mar 07 | TV Shows |  <a href="#">Little Mosque On The Prairie S01E07</a> PROPER mp4 [www.iPodNova.tv]           | 120.39 MB | 0     | 0        |
| 17 Mar 07 | TV Shows |  <a href="#">Little Mosque On The Prairie S01E08</a> Playing With Fire [www.iPodNova.tv]    | 120.06 MB | 1     | 1        |
| 12 Mar 07 | TV Shows |  <a href="#">Little Mosque on the Prairie S01E08</a> HDTV XviD-2HD[www.torrentsforall.net]  | 178 MB    | 0     | 0        |
| 08 Mar 07 | TV Shows |  <a href="#">Little Mosque On The Prairie S01E08</a> HR HDTV AC3 5 1 XviD-FBN               | 350.01 MB | 3     | 2        |
| 08 Mar 07 | TV Shows |  <a href="#">[TT] Little Mosque On The Prairie - S01E08 - HDTV XviD-FBN</a>                 | 175.07 MB | 0     | 0        |

The example below shows various versions of a recent episode of CSI being available the day after the show first aired.



The screen below shows the Azureus Vuze software program used to download one of the above high-definition feeds (in 1 hour and 34 minutes). Note, too, that there were 1,327,169 active users of Vuze at the time this image was captured.



## Barriers to alternative content distribution success

Many barriers exist to the widespread and successful deployment of alternative distribution channels. Some lie with the consumer, or in the commercial agreements they may have with their broadband providers, while some barriers prevent distributors from making significant progress.

### Consumer-level barriers to success

There are a number of potential barriers to success that exist at the consumer level that can affect whether obtaining content by way of Internet-based alternative delivery channels is viable for them.

#### Insufficient bandwidth

The most common barrier is simply inadequate bandwidth. Good quality video content is extremely bandwidth-intensive. Download speeds quoted by ISPs are indicative or, sometimes, maximum speeds, but don't necessarily reflect real-world experience at times. Less-expensive 'light' offerings, designed for the casual user, simply don't provide enough bandwidth for dealing with video content on a consistent basis.

[Comcast announced this month that it will begin rolling out faster Internet service later this year that will have a top speed of 160 Mbps; to put that in perspective, that's 10x the speed of Rogers High-Speed Internet Extreme Plus, Rogers Cable's top (and little publicized) residential broadband offering]

#### ISP usage caps

Even when the consumer does have sufficient speed to download video content, the total bandwidth consumed often needs to be considered. Many Internet Service Providers (ISPs) place a cap on how much bandwidth may be used per month, with excess-usage charges applying if that amount is exceeded. Video downloading or streaming, particularly in HD format, will drive usage up quickly and significantly. However, as standard speeds continue to increase, and infrastructure capacity improves, these caps may become irrelevant. In fact, they may well give way to...

#### Metered bandwidth

Much of the Internet infrastructure in place today was not built with video in mind, and it is being pushed toward the breaking point by an ever-increasing demand for video content. Metered bandwidth, a pay-as-you-go approach, much like the model under which electricity is billed, has several advantages for ISPs. For one, it discourages frivolous bandwidth usage (for example, downloading video torrent content that you may never bother watching, but doing so because there's no direct cost). It also allows for a more equitable billing model: those who use little pay little while those who use a lot pay more (or a lot). It also provides additional potential revenue to upgrade existing infrastructure to meet the continually growing demands being placed upon it.

#### The battle for bandwidth within the home

Many high-speed Internet customers use broadband routers in the home to share their Internet connection amongst other computers in the home. Others may use Internet Connect Sharing (ICS) on Windows or other comparable capabilities to achieve a similar affect. Regardless of technique, the net result is that all computers in the home are using the same, limited bandwidth – and there's no way to control who (or what) gets the bandwidth. In fact, this

applies to multiple functions running on a stand-alone computer, too, such as web browsing, e-mail and video streaming.

ISPs have the capability to provide Quality of Service (QoS) prioritization on Internet traffic allowing them, for example, to give a higher (or lower) priority to VoIP (Voice over Internet Protocol) traffic versus e-mail traffic versus video content. In the home, though, there's no easy way to control QoS. This means, for example, that two or more computers in the same household may be streaming video simultaneously – and end up in competition for service, possibly providing each of them with a degraded experience. Or perhaps a large e-mail attachment will be received, causing a video stream to stall or stutter.

Unless the network bandwidth within the household can be effectively controlled, either electronically or through more rudimentary cooperative methods, the battle for bandwidth may preclude the effectiveness of content delivered over the Internet as a viable substitute for conventional TV content distribution methods until such time as the speed-versus-affordability equation changes to the point that this is a moot point.

[Cisco announced this month that it will begin offering devices that combine set-top-box functionality with home broadband routers (in the U.S.). It's pure speculation, but perhaps in-home QoS will be a feature of these new hybrid devices.]

### **Peer-to-peer fear**

The use of peer-to-peer (P2P) technologies may help break existing Internet backbone bottlenecks that could prevent widespread high-quality distribution of video content over the Internet. However, there may be consumer reluctance to use services that turn their computers into servers that upload content to other users, or others who are wary of P2P due to its negative association with illegal content sharing.



## Distributor-level barriers to success



### A delicate balance

What's economically viable isn't always technologically feasible and, conversely, what's technologically feasible isn't always economically viable. Over time, for any given technology, these two forces – economic viability and technological feasibility – tend to come together in harmony where sufficient demand exists. The idea of a teenager having a cell phone twenty-five years ago wasn't realistic – it wasn't affordable, and the analogue networks of the day didn't have the capacity to support the number of users that would be result from wide-spread cell phone usage by teenagers. Today, however, the result of twenty-five years of increased consumer uptake has led to lower pricing for

operators and consumers, making the proposition economically feasible, and far-superior digital networks, making the prospect technologically feasible.

Alternative distribution of television content is in its infancy and both economic and technology limitations are having a great impact on what is offered and how it is offered. Study after study has shown an increase in online content consumption, so it's certainly reasonable to assume that increased demand will continue to lead to greater economic viability and to technology advances that make mass distribution of content via non-conventional channels viable, and even profitable. But we're not there yet and everyone – broadcasters, producers, writers, directors, actors, advertisers, consumers and regulators – must live in this emergent and transitory state in which we find ourselves today.

### Rights clearance

One of the biggest barriers to licensing content is rights clearance. It's a complex maze that is often slow to navigate, sometimes impenetrable, and occasionally prohibitively expensive (episodes of WKRP in Cincinnati, for example, are not available with the original soundtrack in licensed form due to the high cost of licensing all of the music used in the episodes; WKRP has been licensed with alternative music substituted for the original).

### Rights lingering on the shelf

Though they carry little long-form content that has a presence on Canadian broadcasters, Canada's MoboVivo does have rights to some such programming. In our review of MoboVivo, we discovered some interesting things with respect to their Canadian programming. In one case, episodes of a Canadian program were available, but only to Canadians – a reasonable situation. In contrast, though, for another *Canadian* program, MoboVivo has the rights to sell the content to anyone – *except Canadians*. We looked to see if the content in question was available to Canadians through any other channel but could not find it anywhere. We contacted the head of digital media at the company that produced the

program. The situation – quite familiar from anecdotal stories told by producers – was that the Canadian specialty service (without whom the program would never have gotten off the ground) insisted upon all domestic new media rights for the program – and then proceeded to sit on them, doing nothing with them. So while the rest of the world can buy this Canadian program, no one in Canada (the only country in which the program is broadcast) can do so. Nor was this case unique for this production company – they faced the identical situation with another one of their productions, this time with a different specialty service. (In one case, the specialty service is owned by CTV, the other is now owned by CanWest). To say that the production company is frustrated by this practice would be an understatement.

As long as broadcasters demand such rights and do nothing with them, the domestic production industry will suffer. Not only will Canadian consumers continue to be deprived of flexible content acquisition choices, and Canadian producers continue to lose potential revenue, but as long as the rights remain on the shelf, the writers, directors and talent lose out on revenue opportunities, too. This is a time of great opportunity – and great challenges – and this myopic defensive approach does nothing to capitalize on opportunities nor does it do anything constructive to counteract the challenges the industry faces.

## Personal information disclosure

We found that very few sites required any personal information disclosure. No broadcaster website required that we register in order to view content. Services that sell content do usually require registration but personal information collected is minimal beyond that which is required to process a credit card transaction and, often, a valid e-mail address. Some do request that the consumer indicate their age in some way, presumably as a filter for under-aged viewers, but the information that is provided is not verified in any way. Bell Video Direct did request gender and date of birth, though, in case a password reset were to be required in the future. This was the only questionable privacy issue we encountered.

## The broadband experience

### Watching TV on a computer

Most content consumed (or delivered) over broadband today is viewed on a non-traditional device – that is, it doesn't end up being watched on a TV set but rather is viewed on a computer or on some form of portable device. Some services, such as Apple TV and Vudu, aim to change that, as do video game consoles makers with their content delivery services. What these all have in common is that they require specific hardware to accomplish that task.

In fact, though, given a modern computer and a modern TV set, the two can be connected directly and broadband content can be consumed in this way. Older computers and older TVs can be connected, too, provided both have S-Video connections.

It's important to recognize that, increasingly, watching TV content on a computer does not necessarily mean watching it on a computer monitor. After all, digital cable, satellite and telco-IPTV services all use set-top boxes that are, in fact, specialized computers.



Whether watching broadband content on a high-def TV set or a computer monitor, though, the quality of the experience is largely driven by two factors: the quality and resolution of the content and the experience that the video player itself delivers.

## Video players

All of the various players allowed some degree of image resizing, though that often was limited to two choices (either standard and enlarged or standard and full-screen). Rarely, the player would open itself in a resizable window that allowed greater flexibility (for example, the implementation of a Flash-based player by TQS). In virtually all cases, though, the streaming feed remained at its original resolution so the result, when made larger, was a stretched and zoomed version of the original.

Almost all of the players allowed 'trick play' or 'scrub' capabilities (that is, the ability to go back and forth in the video stream or pause the stream). This usually wasn't the case, though, for simulcast programming since implementing such capabilities for a simulcast feed would make it impossible to use IP multicasting as a distribution technology unless the content was cached locally as it arrived.

Players that remain embedded in a web page provide a cluttered feeling and, while they may be suited to some viewing paradigms, they don't well serve the consumer who is looking for an undistracted full-screen experience. Some players were able to 'shed' the surrounding browser controls in full-screen mode, but many didn't. Indeed, many implementations didn't allow the image to be up-sized at all, while many others only allowed a small increase in the image size. Again, though, even when the players allowed significant resizing, the image was merely stretched and most content wasn't delivered at a sufficient resolution to make this form of viewing enjoyable.

## Flash Player

Flash-based sites are very common for broadband streaming. One of the advantages of Flash is the very-high penetration rate for Flash players and its multi-platform support. However, as consumers increasingly have more than one monitor connected to a computer, it's a reasonable expectation to be able to watch full-screen video on one monitor while working on another, and the Flash player, whether by design or otherwise, won't permit this:

*"The full-screen mode in Flash Player is initiated through ActionScript and can be terminated through ActionScript, keyboard shortcuts, or **by the user switching focus to another window** [emphasis added]."<sup>13</sup>*

## Windows Media Player

Like the Flash Player, Windows Media Player is used for a lot of online content. It, too, has an annoying tendency to sometimes drop out of full-screen mode unexpectedly.

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<sup>13</sup> Source: *Exploring full-screen mode in Flash Player 9*, Adobe Developer Connection ([http://www.adobe.com/devnet/flashplayer/articles/full\\_screen\\_mode.html](http://www.adobe.com/devnet/flashplayer/articles/full_screen_mode.html))

## Move Media Player

The Move Media Player, from Move Networks, is used by ABC, Fox, and the CW, and ABC also uses the high-definition version of the player. The standard version of the player offers four different video sizes ('mini', 'normal', 'big' and 'fullscreen'). Like the HD version, the standard player appears to do adaptive streaming (see [Technology case study: high-definition streaming](#) for more information on adaptive streaming).

In our testing of the many various players used by U.S. and Canadian broadcasters, the Move Media Player (not used by any Canadian broadcasters) provided the best overall experience – by far.

## Not made-for-TV

### Quarterlife

Although originally conceived as an ABC pilot, intended as a conventional broadcast production, that's not how things turned out. ABC passed on the program and the producers decided to produce the series for the Internet and build a rich social network around the program. Part of that rich social network is the ability for the user to add videos, images, audio tracks, and blog entries to the community.

Its success has led to the announcement that NBC will pick up the program for broadcast, re-worked for a one-hour timeslot and, significantly, the television network broadcast will remain a *second window*, behind the website and MySpace distribution.

Quarterlife has demonstrated two things in its short existence: first that it is possible to successfully create 'TV' program content exclusively for the Internet and, secondly, that success on the Internet can lead to a subsequent conventional broadcast deal. As it goes forward, Quarterlife proves, too, that we don't need to think always in terms of TV broadcast being the first window and alternative platforms taking a backseat until the program has aired. Furthermore, Quarterlife's success in building a complex social community environment in parallel with the first airing of the show demonstrates that such capabilities needn't be considered as adjunct features to a successful TV show but, rather, can be an integral part of an overall entertainment package.

Lastly, the integrated nature of the program on the Internet, with the rich social community experience, raises questions about what would happen were a Canadian broadcaster to decide to pick-up the program. Would Canadian audiences share the same website and experience as their U.S. counterparts, as they do today, or would they be ghettoized in some manner due to territorial rights? As the latter approach seems self-defeating, does this new type of hybrid programming possibly spell a further threat to the effectiveness and value of geo-blocking practices – and, indeed, or territorial markets as we know them?

## Sanctuary



Sanctuary's<sup>14</sup> producers bill it as "the first broadcast quality, High Definition dramatic series designed specifically for the internet" and say that it's been recognized by the Guinness World Records as the "Highest-budget Television Production Direct to the Web." Like Quarterlife, Canadian-made Sanctuary may well find a life on conventional TV, but in the meantime, it demonstrates that investors are viewing high-quality made-for-the-Internet TV as a serious business proposition.

It's noteworthy too that Sanctuary makes subtitles available in a wide range of languages for foreign-language viewers. That English subtitles are available, too, is a benefit to the hearing impaired. Subtitles are available at [www.sanctuaryfans.com](http://www.sanctuaryfans.com).

Sanctuary's 11-20 minute episodes are available in both 720p high-definition (HD) and standard-definition (SD) formats. The SD format can currently be streamed or downloaded at no cost (with Vues) or a paid download is available at the show's website; the HD version is available only as a paid download. The SD version, as a paid offering, is \$US 1.99

Users must register to view free streaming and/or to buy content. The registration process requests first and last names and an e-mail address, and requires agreement to Sanctuary's Terms and Conditions.

Free *low-res* content is available via YouTube, veoh and Brightcove (the user is presented with links to all of these sites from which to choose) – but none compare from a quality perspective with the free standard-definition download available at Azureus Vuze. The producers encourage users are encouraged to embed links to the episodes in their own pages.

Sanctuary has social community features and a small range of additional content available.

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<sup>14</sup> See [http://www.sanctuaryforall.com/social\\_sanctuary/pages.php?page=about](http://www.sanctuaryforall.com/social_sanctuary/pages.php?page=about) for more information.

|  |  |
|--|--|
|  |  |
| <p>Sanctuary website episode purchasing options.</p> | <p>The encoding specifications for one episode are shown. There are no Digital Rights Management (DRM) restrictions on the file.</p> |

## Made for TV... and more

### Bite TV

Bite TV is a Canadian broadcaster carried by Canadian BDUs (cable TV, satellite and telco-IPTV operations). Bite's a relative newcomer, conceived at a time when alternative delivery channels were on the horizon, and born as these nascent channels were themselves coming to life. Unlike most broadcasters, for whom new media is, by necessity, an afterthought, and something that requires re-invention and re-engineering, new media is built into the very core of Bite TV's operations.

In addition to standard TV distribution, Bite's content is available on BDU VOD offerings, Bite's own website, on Canada's three main wireless carriers, on Joost and on YouTube... and the list keeps growing.

Bite's content is aimed at the young male demographic which, of course, constitutes a large part of the consumer base for alternative delivery channels.

## Music-themed broadcasters

Like Bite TV, both MuchMusic and MTV Canada (and, of course, the U.S. MTV) have done a commendable job of extending their worlds beyond that of broadcasting. Like BiteTV, they target younger viewers who, again, are more likely to use – and expect – content delivered by way of alternative channels.

Both MuchMusic and MTV Canada have a wealth of video content available on their websites, a strong mobile-carrier presence, and channels on Joost, and full-length content on BDU VOD services.

## Advertising

### Pre-roll advertising

Pre-roll advertising is becoming increasingly common. Pre-rolls typically are either 15 or 30 seconds long and may precede either full-episode content or short-form content (for example, clips and ancillary content). Sometime the pre-roll for short-form content is even longer than the clip itself.

|   | <i>Canada</i>                    | <i>U.S.</i>   |
|---|----------------------------------|---|
| <i>% of those broadcasters that had video content that used pre-roll ads</i>    | <i>42</i>                        | <i>56</i>   |
| <i>% of broadcasters with pre-roll ads for external advertisers</i>             | <i>45</i>                        | <i>89</i>   |
| <i>% of broadcasters that used pre-roll for internal promotion</i>              | <i>73</i>                        | <i>22</i>   |
| <i>% of broadcasters with pre-roll ads that have click-through capabilities</i> | <i>36</i>                        | <i>78</i>   |
| <i>Example advertisers</i>  | American Express, Cisco, e*trade | Charles Schwab, Comcast, Dell, Honda, Gillette, Kimberly-Clark, Nissan, Novartis, Old Navy, Proctor & Gamble, Toyota, Verizon |
| <i>Sample size</i>  | <i>36 broadcasters</i>           | <i>16 broadcasters</i>  |

### Pre-rolls and multi-segment programming

Often long-form content is divided into multiple segments (implicit segmentation) or multiple clips (explicit segmentation). In the former case, the player plays all segments automatically, though there is usually another video ad

in each of the between-segment intervals (most often the same sponsor as the pre-roll, and very often the same ad is repeated). In the latter case, the clips are listed as separate video segments – sometimes the viewer must manually select the next clip, sometimes the player does so for them. In either case, there may or may not be additional video advertising.

### *Pre-roll penetration*

42% of Canadian broadcasters examined use pre-roll advertising for their video content. Of those that do, 45% have corporately-sponsored ads while 72% run promotions for other programming properties within the same broadcasting group.

56% of American broadcasters examined use pre-roll advertising for their video content. Of those that do, 89% have corporately-sponsored ads while 22% run promotions for other programming properties within the same broadcasting group.

### *Click-through pre-roll advertising*

Some pre-roll (and inter-segment) video ads are 'clickable' and open another browser window that is related to the advertising. In almost all cases, the video continues (only The N, in our observation, paused the video).

Regardless of whether the ads were internal promotions or other corporate ads, U.S. pre-rolls that we tested had a click-through capability 78% of the time while the corresponding figure for Canadian ads was 36%.

### *Internal promotion*

Perhaps due to the higher-level of media ownership concentration in Canada, it was often the case that internal ads for other programming were used to promote content on other stations within the same media group. In the U.S., internal ads were used to promote other shows on the same station.

### *The pre-roll advertisers*

Pre-roll advertisers on Canadian broadcaster websites included big names like American Express, Cisco, and e\*trade. On American sites, the names were likewise familiar names like Comcast, Dell, Honda, Gillette, Kimberly-Clark, Nissan, Novartis, Old Navy, Proctor & Gamble, Toyota and Verizon.

On either side of the border, no small or regional companies were found in the pre-roll advertising content or in the other ads found on the broadcasters' web pages. (Hydro Quebec did appear as a banner-ad sponsor on TQS programming but the pre-roll was internal promotion).

### **Observations**

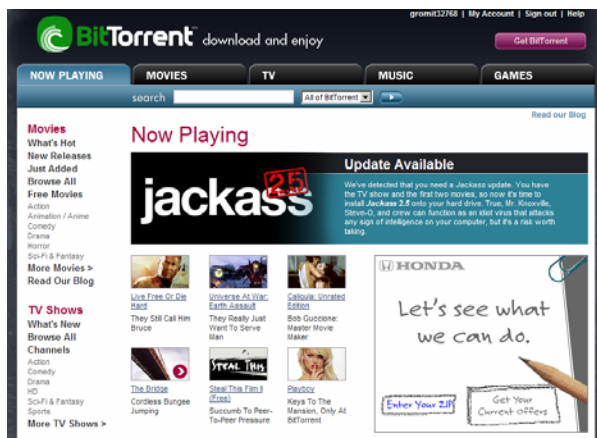
U.S. broadcasters are far more likely to use pre-roll advertising for video content (56% versus 42%), are far more likely to have external corporate sponsors for the pre-roll advertising (89% versus 45%), are far less likely to use pre-roll for internal promotion (22% versus 73%) and are far more likely to provide a click-through value add experience for the advertisers (78% versus 36%).

## Targeted advertising

While alternative distribution technologies lend themselves well to targeted advertising (that is, the sending of specific ads to specific consumers based on data collected about them), we were not able to observe any evidence of this in practice. At a broad level, though, geographically-determined ad presentment did occur at some sites, as illustrated below when the BitTorrent.com website was accessed with Canadian and U.S. IP addresses:



Canadian IP address – President's Choice Financial ad



U.S. IP address – Honda of America ad

## Matching the experience to the expectations

Only when six elements come together in harmony will the consumer enjoy a satisfactory viewing experience. Consumer expectations, obviously, are very important. For example, if the consumer expects a full HD 1080p big-screen experience, that's quite a different requirement than wanting to watch windowed playback on a desktop. The device, coupled with the consumer expectations, drive the requirements for the other four elements: time, bandwidth, processing power and image quality and these four must be in balance to deliver an experience that will meet expectations. If the image quality is not matched to the device and the viewing expectations, nothing else matters – the consumer will be disappointed. Beyond that, though, there may be trade-offs needed between time and available bandwidth in order to satisfy the viewer. Where bandwidth is inadequate for the desired outcome, streaming isn't a viable option and a download approach, at slower than real-time, is required. Finally, if the computer doesn't have enough video-processing horsepower (processor configuration, speed and available memory), all else is for naught.



The importance of computing horsepower can't be ignored. See [Appendix D: Processing power requirement illustration](#) for more information.

Most content today is not offered at a sufficiently high resolution to deliver a full-blown HD experience, whether that be on a big-screen TV set or a computer monitor – but some is, and where sufficient bandwidth is available, the experience can be satisfactory. We can only assume, too, that more and more content will become available for high definition streaming and as bandwidth available to consumers continues to grow, the prospect of a day when the consumer has a vast choice of high-def content, and the ability to view it in real-time (buffering delays excluded), is not far off. Network capacity issues and network backbone congestion are another matter, though more effective content delivery networks (CDNs) and peer-to-peer networking offer the prospect of eliminating these barriers, too.



CDNs provide a much more efficient distribution mechanism for popular content than point-to-point streaming between the broadband broadcaster and the viewer, but CDN services have tended to be quite expensive. The October 2007 issue of Streaming Media Magazine, in an article entitled “What the CDNs Are Charging for Delivery”, reports, though, that costs are dropping significantly. CBC uses the Akami CDN service for broadband distribution of its Hockey Night in Canada live broadcasts.

Peer-to-peer (P2P) networks are another approach to obtain more efficient and cost-effective distribution of content. While illegal peer-to-peer file sharing gave P2P a bad name, the reality is that P2P technology is, at this time, one of the most promising ways to deliver on the ever increasing appetite for video content. While there is definitely a lot of illegal P2P video content exchange happening, it's also the technology that powers Joost, a service that deals only in fully licensed content.

### Keeping the consumer informed with RSS

Global TV and caone.tv are among the Canadian media operations that have introduced RSS (Really Simple Syndication) feeds for their video content. Subscribers to an RSS feed are automatically notified when new content is available online. Unfortunately, from what we could see, the idea has not been well implemented. Global TV's feeds are at the *episode* level rather than the *program* level, rendering them of little value. The CW network's RSS video site feeds, on the other hand, contain links to clips and full episodes as they become available and are done at the *program* level, not



the *episode* level. The feeds offered by canoe.tv<sup>15</sup> do not seem to be active at this time and merely redirect the user to the canoe.tv site – a good idea, but a flawed implementation.

The U.S. network, Showtime, does seem to have a good implementation of program-level RSS feeds.

The Bell Video Store offers RSS feeds, too, to provide notification of new releases.

RSS can also be a video content delivery channel in and of itself but we didn't find anyone using it in this way<sup>16</sup>.

## Ready for primetime?

As things stand today, does any of the content available, given sufficient consumer bandwidth, offer a viable alternative to cable, telco-IPTV, satellite or over-the-air as a delivery mechanism for the 'living room' TV experience (not that that's the objective of many)? The answers may be surprising...

### The CRT TV Experience

Though almost anachronistic, the worlds of broadband TV delivery and the traditional CRT (cathode ray tube) TV set do co-exist at this time and, interestingly, it's as these two ships pass in the night that we often find the most satisfactory meeting of viewing device and alternative delivery technology. Most streamed content we examined provided an acceptable viewing experience on a 27" CRT that was connected via an S-Video cable to a computer, as an additional monitor, with the resolution set to 800x600. In some cases, though, while the image quality was sufficient, the software player environment was intrusive, leaving browser scroll bars or controls visible throughout playback. There were a number of exceptions, though, at both Canadian and U.S. sites, where the entire screen was given over to the content – and the experience was comparable to watching a standard-definition broadcast. Bandwidth requirements weren't excessive, either, and most high-speed residential broadband connections can support the needed throughput for streaming. Where sufficient bandwidth isn't available, but patience is, downloading of content provides an alternative means to the same end, but usually as a paid-for-service rather than the no-cost advertising-supported streaming services.

If the content that the consumer wants is available, and the consumer is satisfied with an experience that is comparable to a normal standard-definition broadcast, this is indeed a viable alternative to over-the-air (OTA) or broadcast-distribution-undertaking (cable, satellite, telco IPTV) offerings.

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<sup>15</sup> See [http://public-xml.feedroom.com/public\\_rss/canoetvlvfr\\_feeds.html](http://public-xml.feedroom.com/public_rss/canoetvlvfr_feeds.html)

<sup>16</sup> See *Really Simple Syndication for video content* in Vol. 1 Issue 3 of The Two Solitudes Journal at [journal.twosolitudes.com](http://journal.twosolitudes.com) for more information.

## The high-definition experience

Whether for viewing on a high-resolution LCD monitor or a big-screen plasma or LCD TV set, high-definition content is scarce and consumes a lot of bandwidth. In our tests, for 720p content (the highest we found any service streaming), a constant rate of about 2.0 mbps was required in order to provide the maximum available streaming experience. While many residential connections have peak speeds that exceed this, sustaining that level of throughput for the duration of a nominal 30- or 60-minute program is another matter. Individual results will vary, and they will vary from hour to hour and from day to day, but if the appropriate bandwidth is available, and enough of today's limited selection of high-def (720p) content is of interest to the consumer, this, too, can be a viable alternative to conventional delivery methods.

[Note: none of the content we examined required HDCP (High-bandwidth Digital Content Protection) capable equipment<sup>17</sup>].

## Pushing the envelope with high-definition content

We're beginning to see more and more HD content available through alternative delivery channels. These tend, of course, to be Internet-based as there's no point in targeting HD-quality content at mobile devices (today).

Downloaded HD content has an advantage over streamed HD content as it is time-independent. Even the slowest connection, given enough time, can download HD content, but, if the expectation is for immediate viewing, then a fast connection is a must.

While many broadcaster websites offer an enlarged content view that displays at 720 pixels in width, most are merely stretching a lower-resolution image to that size. High-definition content is hard to find on broadcasters websites, and when it can be found, it is 720p HD, not 1080p. Nonetheless, it still can be a very pleasing experience when compared to most broadband streaming.

Fox offers one program in high-def while we found no high-def content at CBS, NBC or any of the major Canadian broadcasters. ABC, on the other hand, offers HD streaming for many of its top programs including *Desperate Housewives*, *Grey's Anatomy*, *Ugly Betty*, *Pushing Daisies*, and *Lost*.

## Technology case study: high-definition streaming from ABC.com

ABC recommends a connection speed of "2Mbps or more." That's *available* bandwidth – so anything else running on the same connection must be taken into account when determining whether enough bandwidth is available, BUT the 2 Mbps is the requirement for the best-possible image, and, thanks to the technology employed, the content is still quite watchable (and better than most other broadband streaming content) at somewhat lower bandwidths.

It is also noteworthy that although we had plenty of bandwidth, we couldn't reach maximum throughput on ABC's high-definition streaming service on many of our testing devices, so a powerful computer is definitely a key element to achieving success. ABC suggests a dual-core processor, 128MB of video RAM, 1 GB of RAM, and a monitor resolution of

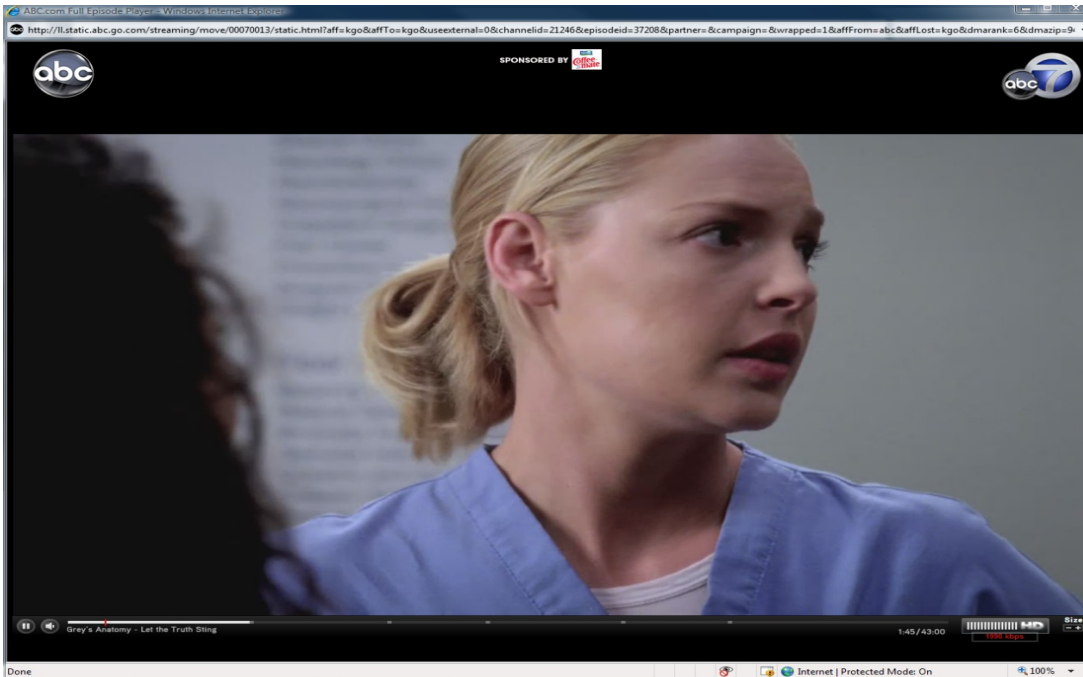
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<sup>17</sup> See <http://en.wikipedia.org/wiki/HDCP> for more information

at least 1300x770 for optimal enjoyment. We obtained very good (and sometimes excellent) results with machines that did not meet the dual-core processor requirement (Test machine #1 and Test machine #6)

ABC HD streaming uses the HD version of the Move Media Player. This version uses a dynamic-bitrate approach. The player on the viewer's computer provides on-going feedback to the server and the server adjusts the streaming bitrate on the fly to provide the best possible viewing experience given the available bandwidth (and possibly available processing power) at that time. The player provides a status indicator (bars) and shows the bitrate, so the user may see these fluctuate throughout the program (and, of course, the image quality will vary, too). Adaptive streaming technologies typically require that the content be encoded at multiple bitrates, allowing the server switches seamless between the various versions as needed. This approach delivers the optimum viewing experience possible and is an approach that all broadband streaming services would do well to consider.

The images below illustrate the player at two different streaming rates.



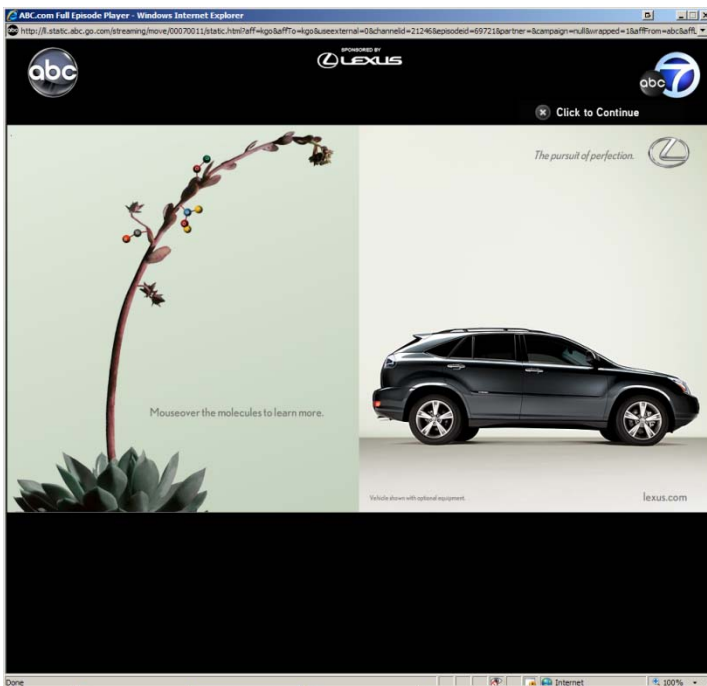
ABC high-definition 720p streaming broadcast at maximum screen size and maximum obtained bitrate (1990 kbps)



ABC high-definition 720p streaming broadcast at maximum screen size and reduced bitrate (1377 kbps); still a very good image

### Advertising

These broadcasts contain a pre-roll, 4 ads at intervals in the program, and a pre-credit-roll ad. All are about 15 seconds long, though the ads remain in place (and may continue playing or allow further interaction) upon completion, until the user presses the 'click to continue' button to return to the show.



## Expect the unexpected

Broadband streaming isn't new, but it is still evolving and suffering growing pains. During a month of testing, we encountered many oddities. Windows Media Player would sometimes show the image upside down briefly. With some players, changing the viewing size from large to small, or the other way around, would cause the video to start at the beginning again – including the pre-roll advertising. This was usually the case, too, if the viewer switched between bandwidth speed (or 'quality') settings. And sometimes something as simple as clicking on a 'full screen' button would cause a player to crash and vanish without a trace. Our favourite, though, was the experience depicted below:



*Ah yes... where would we be without the advertisers?*

Before anyone considers condemning broadband streaming as an unviable technology, we need to remember that conventional distribution mechanisms aren't without their own share of glitches, but over the years these have become less frequent. We can expect the same continual improvements in the online world too. For now, though, the viewer's expectations may at times not be met. Part of the problem (and this will likely be a perpetual problem) is that the computer isn't a dedicated, built-for-purpose device for TV viewing, unlike the conventional TV. Adverse interactions between multiple tasks running on a computer at the same time can cause some very unpredictable results to which no computer program can be totally immune. That's where built-for-purpose devices like Vudu and AppleTV can change the game.

# PART III:

## Bringing the Canadian picture into focus

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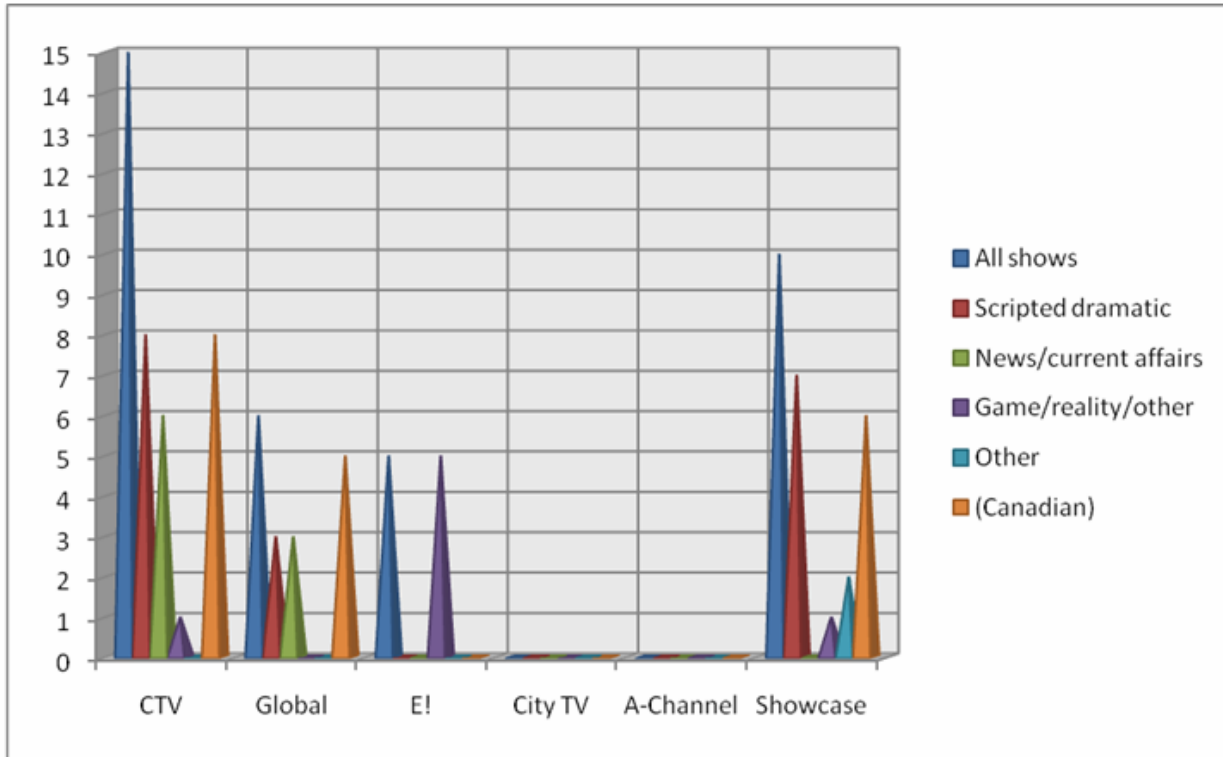
### Full-episode content

We looked at many Canadian broadcasters, from the big television networks to some of the smaller specialty services. Everywhere we looked (with the notable exception of the A-Channels) we found video content and where we did, there was at least some degree of full-episode content available (although, particularly in the specialty world, a 'full episode' may, in fact, be very brief).

CTV has approximately eight scripted dramatic evening-time programs that have full-episode content available on broadband while Global has about three. When we include news and current affairs programs, the numbers rise to twelve and six respectively. CTV also has three late-night programs available, bringing its total to fifteen.

E! had no scripted programming available on broadband – and there was no Canadian content among the five full-episode non-scripted programs.

The chart below illustrates the full-episode availability at various Canadian television networks – with the Showcase specialty service included for illustrative purposes:



[Note: due to schedule changes, exacerbated by the WGA strike, broadband availability, particularly for stations that carry a lot of scripted U.S. programming, the number of programs available change on a frequent basis. Where they could be identified, we've counted programs that were available earlier this season, but aren't currently, including Global TV's Heroes and CTV's Pushing Daisies)]

## Conventional broadcasters compared to specialty services

Like the conventional broadcasters, the total amount of content available at specialty service broadcaster websites varied considerably. Some had no video content at all, while others had moderate amounts, but of those we examined Showcase had the most content available.

Specialty services often face a unique challenge: how to identify their subscribers. Since many of these services are subscription based, there's an understandable desire to limit content streaming such that only subscribers can gain access. But that's far easier said than done. HBO has announced that they will be testing not just an on-demand broadband service but broadband simulcasting, too – and these will be only available to subscribers (or, in fact, a subset of subscribers). The way they're accomplishing this is to work with an Internet Service Provider (ISP) that is also a cable company (as many are). Customers of this cable company who subscribe to the HBO broadcast cable channel AND who

get their broadband service from the ISP arm of the same company will have access, and this is possible because the subscriber records for the cable operation can be cross-referenced with those of the ISP operation.

It's far from a perfect solution, though. Subscribers to the cable service who use another provider for Internet access won't be able to use the broadband service. Likewise, subscribers to the ISP service who get their TV by satellite will be excluded, too.

While this may be good for cable companies who are also ISPs, and likewise for telephone companies that offer ISP services and telco-IPTV, as they may benefit by having more subscribers for bundled services, it's an approach that's limiting for the consumer. Nonetheless, this may be the best way for specialty services to expand their broadband presence without giving their content away for free.

## **Canadian content at broadcaster websites**

CBC offers a vast amount of content on broadband, and not surprisingly, most of it is Canadian programming. While Canadian news and current affairs programming is often available, broadband streaming of Canadian primetime dramatic programming is more of a mixed bag at CTV and Global.

Of the eight scripted primetime programs offered on CTV broadband, five were Canadian (63%), while at Global TV, two out of the three were Canadian (67%), so Canadian content is well represented, at least in comparison to U.S. content.

The Canadian-content picture is even brighter with specialty services – although the amount of content varies considerably from channel to channel, a large amount of the content is Canadian. From HGTV to the Food Network, Treehouse to BNN to TSN, Bite TV to S-Vox, there's a huge amount of Canadian content available to viewers. For specialty services, the ratio of Canadian to U.S. programming on broadband is often higher than it is for their linear broadcast programming.

### ***Primetime and the ratings numbers***

The bulk of the CTV and Global TV primetime schedules are made up of American programming, yet only a small percentage of that content is available in full-episode form on those television networks' websites. In a given week (and, of course, it varies) Global TV's 7:00 PM to 11:00 PM line-up is made up of about 75% American content, and the same is true for CTV's line-up.

It is during that time that the big TV ratings number happen. For the week of January 14-20, 2008, CTV had thirteen of the top twenty programs, Global TV had three, and CBC had one (per BBM Nielsen Media Research). Only three Canadian programs made the top 20: CBC's Hockey Night in Canada, the CTV Evening News and CTV's Corner Gas.



The good news is that all three of those Canadian programs are available to Canadian consumers through alternative distribution channels in full-episode format:

- Hockey Night in Canada (simulcast and on-demand broadband streaming)
- CTV National News (on-demand broadband streaming)
- Corner Gas (on-demand broadband streaming and iTunes)

The remaining 85% of the top-20 programs were America and the picture is quite different for American content. Many of the 10 programs watched by Canadians that week are perennial favourites: Criminal Minds, Grey's Anatomy, CSI, CSI New York, Law and Order: SVU, ER, Law and Order and House. Yet we have to look down the list to the 25<sup>th</sup> position to find any American content that is available to Canadians by any legal alternative distribution channel: Terminator: The Sarah Connor Chronicles (it's available at CTV's primetime video portal).

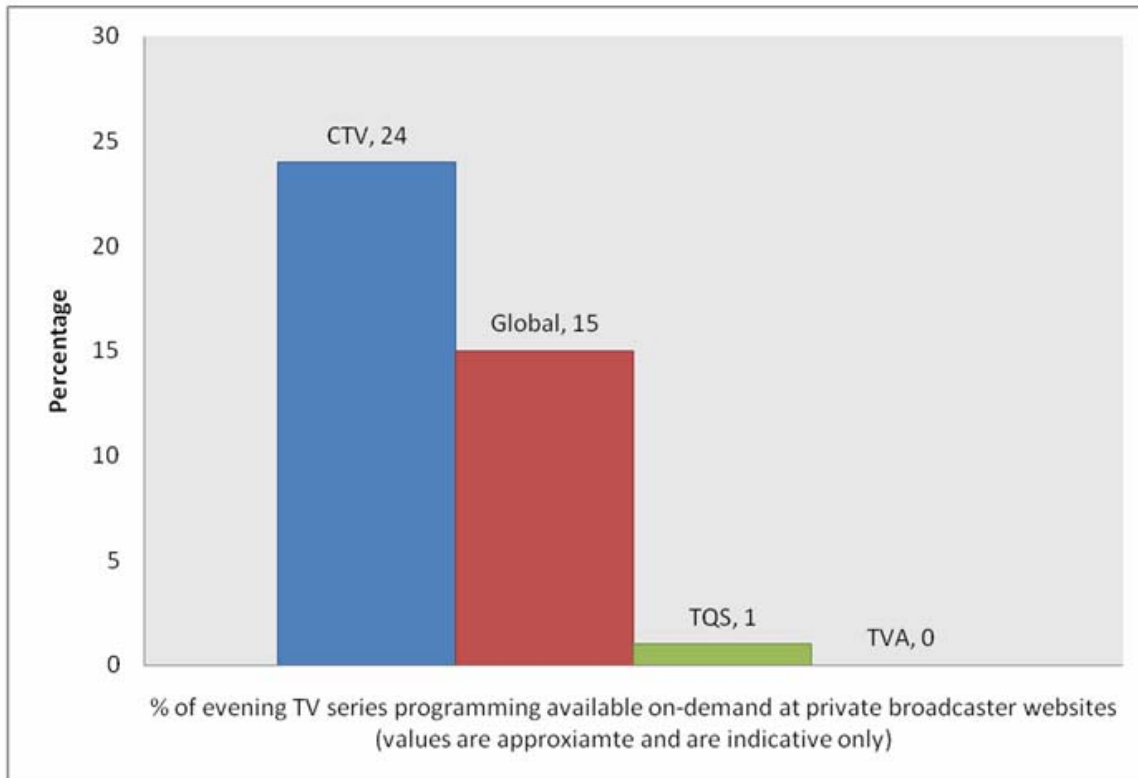
We need to bear in mind, of course, that many U.S. programs have suspended production at this time due to the writers' strike so these results may be slightly atypical. Nonetheless, there are two obvious conclusions that can be reached: Canadians are well-served by alternative distribution channels for the most popular domestic content but have very little alternative channel access to any popular American content.

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Canadians are well-served by alternative distribution channels for the most popular *domestic* content but have very little alternative-channel access to any popular American content

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## How do English- and French-language programming compare?



Clearly, English-Canadian audiences have greater access to content of this type on an on-demand basis than French-Canadian audiences. TVA makes no such content available, while TQS has only one program available. French-language private broadcasters offer very little scripted dramatic / current affairs evening programming through broadband.

TVA has chosen other approaches as their preferred alternative distribution vehicles. For on-demand content, they've opted for cable TV as their preferred on-demand distribution route, with much programming available on Vidéotron cable. TVA-owned specialty channels (Argent, LCN, LCN2 and Shopping TVA) are available through broadband simulcasting through canoe.ca and canoe.tv. Note that TVA, canoe.ca, canoe.tv and Vidéotron are all Quebecor media properties.

If we consider the entire TQS programming schedule, though, we find that 32% of programming is available on-line – it's just that the bulk of it is not non-news evening/primetime programming. Indeed, the bulk of TQS' on-demand programming is comprised of news or talk shows that air during other day-parts.

It's important to note, too, that broadband simulcasting of French language programming is much more common than for English-language programming, as is discussed elsewhere in this document.

## How does Canada compare to the U.S.?

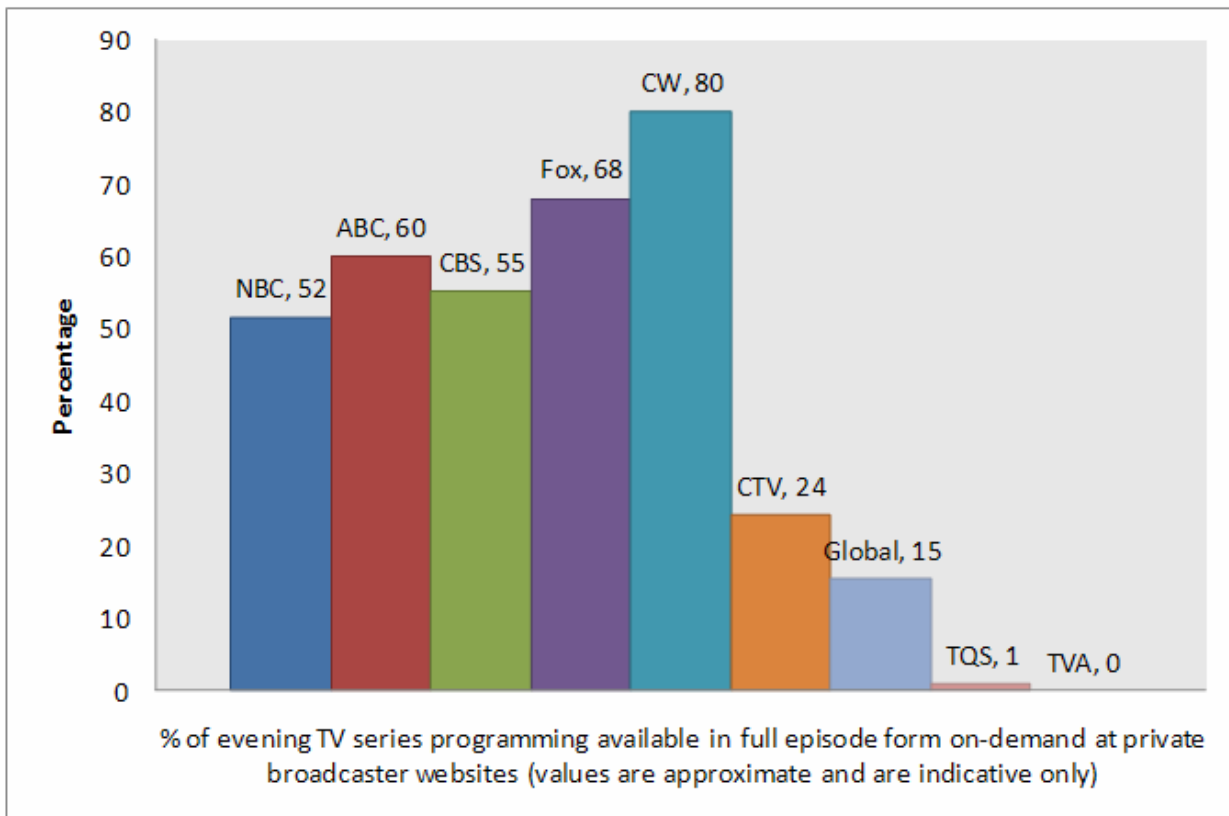
### Broadcaster websites (private broadcasters)

The chart below depicts what percentage of non-news evening TV shows are available on-demand in full episodic format at private broadcasters' websites. We chose non-news evening TV shows because they are usually the highest rated and also because that's where there's a great deal of cross-border content spillover. The five U.S. broadcasters shown represent the five major non-specialty broadcasters in the U.S. market. Between 52% and 80% of their content is available online.

The four Canadian broadcasters depicted represent the major two private conventional broadcasters for both English and French programming.

In all cases, the content is available at no cost to the viewer, usually through advertiser support.

Overall, we see that Canadian viewers have much less access to on-demand evening/primetime programming than their American counterparts.



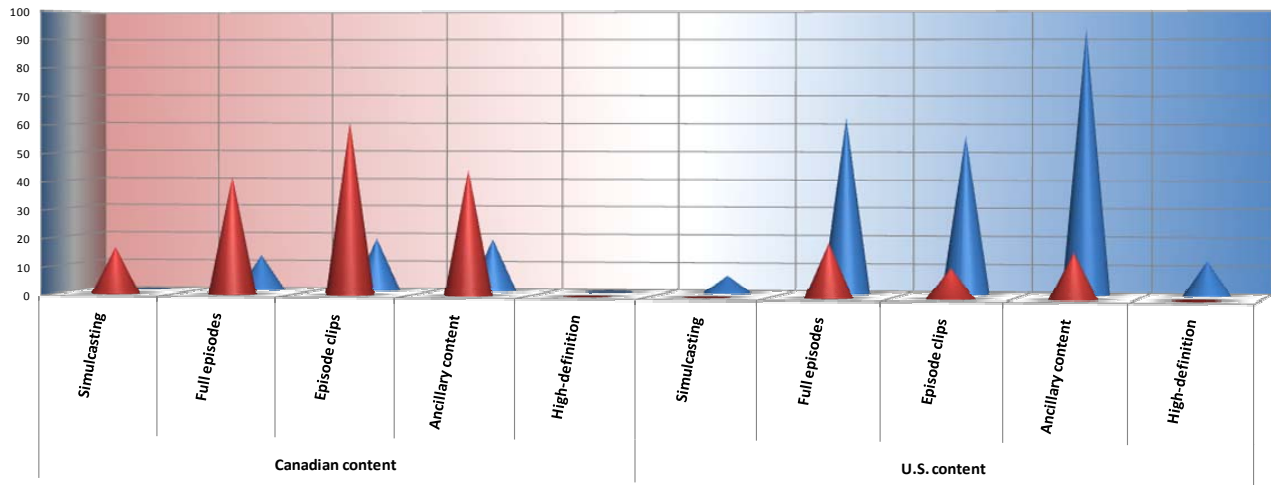
Canadian private broadcasters brought content to broadband more recently than their U.S. counterparts and still lag far behind in terms of how much top-rated content is available. Many top-rated American-made programs in Canada, such

as CSI and House, simply aren't available to Canadians – in any (legal) way – beyond the conventional linear broadcast opportunity. From a technical quality point of view, too, much of what is available from both public and private Canadian broadcasters is not on a par with what the U.S. consumer can experience.

While the U.S. television networks are beginning to offer 720p-quality HD broadband streaming, much of the streaming content available to both Canadians and Americans is still at a resolution that is lower than that for standard-definition television content.

**Occurrence of Canadian and U.S. content  
at Canadian and U.S. broadcaster broadband sites  
(%)**

■ Canadian broadcasters ■ U.S. broadcasters



|                       | Canadian content |               |               |                   |                 | U.S. content |               |               |                   |                 |
|-----------------------|------------------|---------------|---------------|-------------------|-----------------|--------------|---------------|---------------|-------------------|-----------------|
|                       | Simulcasting     | Full episodes | Episode clips | Ancillary content | High-definition | Simulcasting | Full episodes | Episode clips | Ancillary content | High-definition |
| Canadian broadcasters | 17               | 42            | 61            | 44                | 0               | 0            | 19            | 11            | 17                | 0               |
| U.S. broadcasters     | 0                | 13            | 19            | 19                | 0               | 6            | 63            | 56            | 94                | 13              |

The preceding chart yields a lot of information with respect to what type of content is available to audiences in Canada and the U.S. at broadcaster websites.

### **Domestic content**

On both sides of the border, there is a clear predominance of domestic content. 42% of Canadian broadcasters we examined had full episodes of Canadian programs; likewise 63% of U.S. broadcasters offer full episodes of U.S. content.

### **Cross-border content**

With respect to cross-border content, 19% of Canadian broadcasters offer some full episodes of U.S. content and 13% of U.S. broadcasters carry full-episode Canadian content. This figure may be skewed in favour of Canadian content as we made certain to include broadcasters known to carry Canadian content that might otherwise have gone unexamined (for example, the WGN Superstation was included because it carries Corner Gas).

### **Domestic content versus U.S. content in Canada**

There is little Canadian content – or any other foreign content – on U.S. broadcaster schedules, so it is not at all surprising that the broadband content available is mostly American programming. However, the same is not true for Canada. Canadian broadcasters carry a lot of American programming, especially during primetime. While we saw that 42% of Canadian broadcasters offer full-episode Canadian programming, only 19% of those broadcasters offer full-episode U.S. programming.

### **Episode clips versus full episodes**

U.S. broadcasters are more likely to offer clips of Canadian content than they are to offer full episodes of Canadian programming. Yet for American content, full episodes are more common than clips.

At Canadian broadcaster sites, full episodes of American content are more common than clips (19% versus 11%) – yet the opposite is true for Canadian content (42% versus 61%).

What we see, then, is not simply a situation where Americans have more full-episodes and fewer clips while Canadians have more clips and fewer episodes. The difference lies, on both sides of the border, in the origin of the content. Regardless of whether it is a Canadian or American broadcaster, for Canadian programming, episode clips are far more common than full episode availability, and, regardless of whether it's a Canadian or American broadcaster, for American programming, full episodes are more common than clips. What we might infer from this, then, is that there's greater interest and/or success in licensing full episodes of American content than there is for Canadian content – regardless of whether the content is being licensed domestically or for the cross-border market.

*On both sides of the border, Canadian programming is far more likely to be represented by episode clips than by full episodes*

*94% of American broadcasters offer ancillary (value-add) broadband content while less than half (47%) of Canadian*

## Ancillary content

Ancillary content is content that is not comprised solely of episode footage and is generally content that has not been presented over conventional broadcasting channels. It may (or may not) be the same content that would be found as supplemental content on DVDs of the TV series.

Ancillary content often includes behind-the-scenes information, blooper reels, and ‘minis’ or ‘mobisodes’ – short stories that are done with the same actors and either extend the storyline or explore different directions.

Whereas full-episode content availability by alternative distribution extends the opportunity to view the content, ancillary content extends the depth of the experience and is a value-added differentiator available only to non-linear programming channels. It allows the viewer to ‘go deeper’ into the stories and the characters and is very popular.

|                       | Have ancillary content | Have Canadian ancillary content | Have American ancillary content |
|-----------------------|------------------------|---------------------------------|---------------------------------|
| U.S. broadcasters     | 94%                    | 19%                             | 94%                             |
| Canadian broadcasters | 47%                    | 44%                             | 17%                             |

U.S. broadcasters had some form of ancillary content for their programming an impressive 94% of the time, whereas 53% of Canadian broadcaster had no ancillary content at all. 44% of Canadian broadcasters had some degree of ancillary content for their Canadian programming and 17% had some for their U.S. programming.

## High-definition content

Americans do limited streaming today of high-definition (720p) content over broadband. ABC is by far the leader in this. Of ABC’s 30 primetime series, 60% is available in full-episode form at ABC.com. 33% of those shows are available in high-definition (or, to look at it another way, 20% of the all primetime series are available in HD).

No Canadian content is available in high-definition broadband streaming (or by any other legal alternative delivery channel) – in Canada or in the U.S. Illegal torrents of high-definition episodes of The Rick Mercer Report, Little Mosque on the Prairie, Corner Gas and The Tudors can be easily found, though.

## Simulcasting

We found very little simulcasting in the U.S. CBS News offers simulcasting of their evening news program, and HBO has announced that they will soon be simulcasting their east-coast broadcast feed over the Internet – but only to a very small test audience at this time.

In Canada, we found simulcasting available from the CBC for Hockey Night in Canada and from Radio-Canada (both Radio-Canada's main signal and RDI). TVA also offers simulcasting, some of which is available only at certain times and some of which is available at all time (for example, ARGENT and LCN). caone.tv offers a variety of simulcast channels as well.

In both countries, a very small percentage of overall content is available through broadcaster broadband simulcasting.

### Third-party aggregators

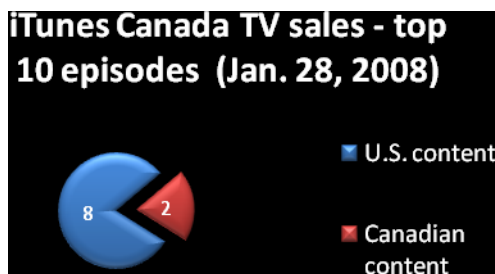
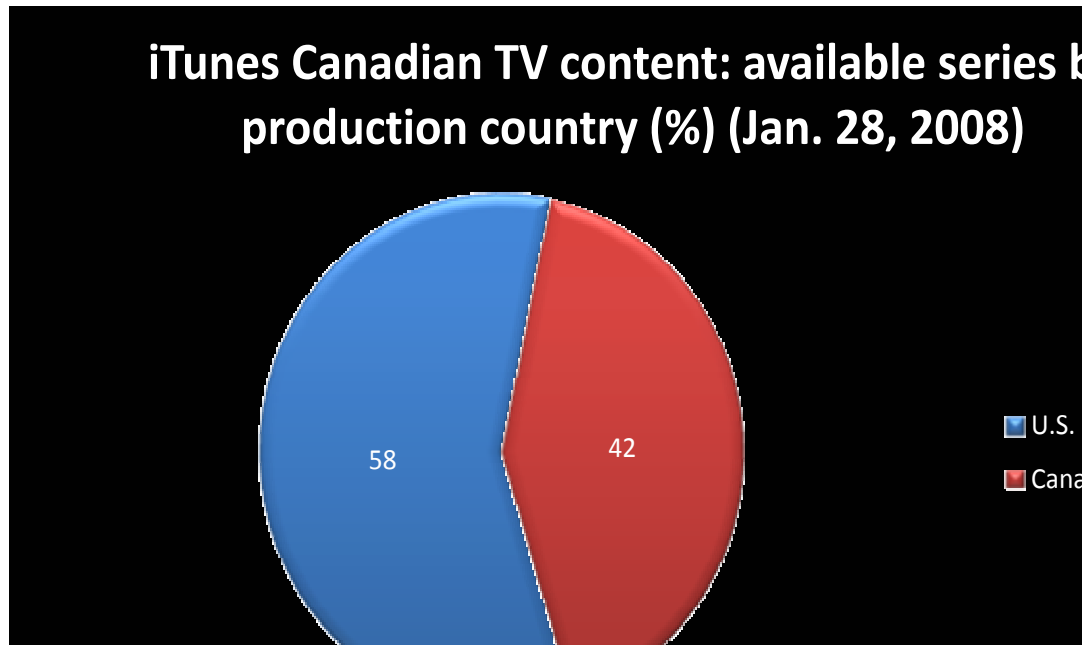
When it comes to international third-party aggregators, they, too, are slow to service Canadians (an admittedly small market in world terms). iTunes didn't bring TV to the Canadian iTunes store until late in 2007, though it has had TV at its U.S. store since 2005. Xbox Live Marketplace was also very slow to come to Canada. Amazon Unbox launched in September 2006 but still hasn't extended its services to Canadians.

The experience with other aggregators varies. Joost has been available in Canada since day one. MoboVivo is a home-grown success. Hulu is still undergoing beta-testing, and is only available in the U.S. at this time, but that's not unreasonable. But even in cases where such services are available, they don't offer the content that garnishes the top TV ratings in Canada —or at least not to Canadians.

When professionally-produced Canadian content is available, as a large amount is on the iTunes Canadian store, it doesn't mean that's what consumers will consume. The charts below illustrate that while, on a percentage basis, Canadian-produced content is reasonably well represented at the Canadian iTunes store (certainly, in a higher proportion than it is on our private broadcasters' primetime schedules) the sales of U.S. content are highly disproportionate.



## iTunes Canadian TV content: available series by production country (%) (Jan. 28, 2008)



### Case studies

Having examined over 30 shows in detail, and many more to varying degrees, clear patterns have emerged – as have some clear anomalies that don't fit these patterns. Rather than taking a show-by-show, blow-by-blow approach to documenting our findings, we've picked a number of programs as case studies to illustrate these patterns and the exceptions to them.

#### Case study: **Degrassi: The Next Generation**

*Degrassi: The Next Generation* is a Canadian-produced program, now in its seventh season. It has aired in Canada (on CTV) since 2001 and in the U.S. since 2002 (on The N). Due to its long-term success in both Canada and the United States, we have chosen it as a case study representing Canadian episodic programming that is available on both sides of the border.

The Degrassi franchise is one of Canada's most successful television creations and that continues to be the case in its current incarnation – Degrassi: The Next Generation (DNG). DNG is very popular within Canada and is one of our most successful exports.

DNG airs in Canada on CTV and in the U.S. on The N and both are currently airing season 7 of the program (the latest). As of January 27, 2008, CTV has aired the first two episodes of the season while The N has aired 6 or 7.

### Broadcaster broadband full episodes

Both CTV and The N provide broadband streaming of DNG episodes, and both use geo-blocking to restrict the audience to those whose point of presence is in their respective markets.

In terms of content availability, current season availability reflects those episodes that have aired to-date in both cases. That's all The N offers, but CTV also offers complete seasons 4 through 6.

The N provides a higher-resolution streaming experience than CTV.

Although the Canadian broadcaster offers more content choice, the U.S. broadcaster offers a better-quality standard-size viewing experience. The standard-sized image is about 15% larger at The N, making the resolution closer to that of a standard SD television signal.



DNG at CTV's primetime video portal (approx. 420 x 315)

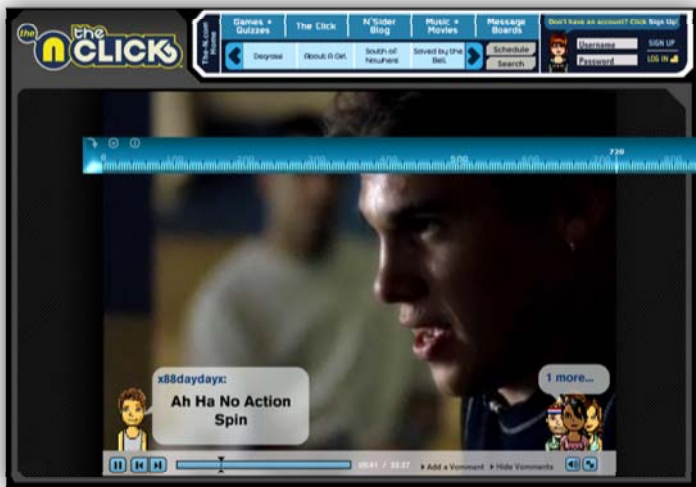


DNG at The N's video portal (approx. 480 x 360)

The players at the two sites take a different approach to offering the user an enlarged viewing experience, and each has its merits. The CTV player takes over the full screen, hiding all other content, and stretches the image to fill the entire screen (regardless of screen resolution, at least within common screen resolutions). If the viewer is looking for an experience that is similar to conventional television

viewing, this is close to it (bearing in mind the sub-SD resolution limitations). The N player, on the other hand, stretches the image to a fixed size of 720x540 but the content remains windowed. This allows the viewer (with appropriate screen resolution) to have other content (an instant messaging window, for example) open and active at the same time. The CTV enlarged-viewing approach, then, is more akin to the passive, lean-back experience associated with traditional TV viewing while that of The N is more in keeping with the lean-forward multitasking computer content consumption paradigm. Of course, if the consumer has multiple monitors, both approaches are suitable for simultaneous interactivity and viewing.

In addition to offering a higher-resolution base image, The N offers a feature called “Vomments” (presumably a contraction of Video cOMMENTS). This allows viewers to chat back and forth with other viewers and adds an element of interactivity and personalization not often found in broadband viewing. (See illustration below). Vomments can be turned on or off depending on user preference.



### Broadcaster broadband additional video content

Both broadcasters have additional video content available at their websites created by the producer, Epitome, including *Degrassi Minis* and *Degrassi on the Set* shorts.

The ‘Minis’ are made-for-Internet video segments that feature the same cast as the TV program. The Minis were introduced in 2005. The N has 10 Minis available whereas CTV has many more as it makes more of the past seasons’ Minis available, too.

Both broadcasters play the additional content using the same player as is used for the full episodes, and at the same resolution. As with the full episode content, The N offers interactive Vomments as an add-on to the viewing experience.

## Alternative broadband distribution

We found the two episodes from season 7 (the current season) and two episodes from the sixth season available at Stage6. Stage6 is a YouTube-like video sharing site, created by DivX, the company behind a video encoding technology of the same name. The episodes we found were of varying resolution. Three were reasonably good quality (624x352 resolution, at 24 frames per second) while the fourth was of higher quality (720x480 at 30 frames per second). All of the episodes contained the CTV 'bug' but we were unable to determine who had uploaded the content to the Stage6 site. The content is equally accessible to Canadian and U.S. audiences and is available both in streamed format and as downloadable files.

## Online sales

### iTunes

DNG is one of the few programs available at both the U.S. iTunes TV store and the recently launched Canadian iTunes TV store. Canadian residents (iTunes sales model is controlled by point-of-residence rather than point-of-presence) can buy all episodes from season 6 and the two episodes that have aired to-date from season 7. U.S. residents, on the other hand, have access to the first six episodes of season 7 – and *all* previous seasons. Setting aside the current-season disparity – it is aligned to broadcast schedules, which is certainly a reasonable practice – U.S. consumers still have much greater Degrassi choice at iTunes than their Canadian counterparts.

### Puretracks

Puretracks has offered DNG for sale in Canada since August 2007. At that time, it was announced that season three would be available and that they expected to add additional seasons at regular intervals over the following few months<sup>18</sup>. To date, five months later, season 3 remains the only available content. Therefore, we will not consider this a serious option for Canadian consumers at this time.

*Given the current much deeper U.S. iTunes catalogue, this round clearly goes to the Americans.*

## Summary

Degrassi's always greener on the other side of the (geo)-fence

Although Canadian consumers have access to a greater selection of older content for streaming than their American counterparts, the video quality isn't quite as good as the American's can get, and the Americans have the benefit of the optional ability to

interact with the video (through Vomments), an element not found on the Canadian site. From a download point of view, Americans have access to the entire series whereas Canadians have only access to more recent seasons (we must, of course, bear in mind that iTunes only very recently launched in Canada). All things considered, we believe that American audiences are better served when it comes to alternative distribution for DNG.

<sup>18</sup> Source: Playback Magazine, August 24, 2007, *Puretracks offers up Degrassi for download*

## Case study: CSI: Crime Scene Investigation

*Whereas *Degrassi: The Next Generation* is a Canadian-produced program (and unapologetically Canadian in content) that is available in both Canada and the U.S., *CSI: Crime Scene Investigation*, despite some ties to Canadian financing, is as quintessentially an American program as they come. Despite this fact, or perhaps because of it, it is a perpetual ratings winner in Canada (and the U.S. too).*

*Now in its eighth season, it has aired in Canada (on CTV) since its initial launch on CBS in the United States. Due to its long-term success in both Canada and the United States we have chosen it as a case study representing American episodic programming that is available on both sides of the border.*

### Broadcaster broadband full episodes

CTV is not carrying full episodes of CSI on its website at this time, nor were we able to find any indication that this program has ever been offered on broadband, despite (or, perhaps, because of) its status as a consistent ratings winner for CTV.

A big and consistent hit for CBS, too, *CSI* is available at CBS's Innertube video portal (at 480x270 resolution). The newest episode is available the day after broadcast, and three other episodes are available though, oddly, not the previous three. (On January 11<sup>th</sup>, we observed that season 7 episodes 7 and 8 and season 8 episodes 1 and 11 (the latest) were available).

*The American consumer wins the broadcaster broadband full-episode round by a knock-out.*

### Broadcaster broadband additional video content

CTV has only one video clip related to the series – an interview from its Canada AM program that discusses the “CSI Effect” – how programs like CSI have affected consumers' perceptions of the police investigation process and how juries today, perhaps, are better educated (or misinformed) about the world of forensics.

CBS, on the other hand, offers a lot of supplemental material to its viewers including Behind the Scenes material, opening sequences, DVD extras and other bonus content, although some (all?) of the content is clearly dated.

*The American consumer wins the broadcaster broadband additional video content round.*

### Alternative broadband distribution

For viewers in Canada, there is no one offering CSI.

Reflective of its extreme popularity, U.S. viewers can find CSI content at Veoh, AOL Video and Joost in addition to the CBS website.

*The American consumer wins the alternative broadband distribution title – unopposed.*

## Online sales

### *iTunes*

The iTunes Canadian store does not offer CSI.

The iTunes U.S. store has next-day episode availability as well as all other current-season (season eight) episodes. It also offers *a la carte* and full-season purchase options for seasons six and seven.

*No content... no contest. Americans win.*

CSI: despite its huge popularity, there are no licensed alternative distribution options available to Canadians

### Summary

While the American consumer is well-served with a variety of choices, we could find no licensed alternative distribution channel for CSI content in Canada<sup>19</sup>.

## Case study: national news broadcasts – comparing CTV and CBS

Both CBS and CTV offer broadband streaming of news content. Both offer news clips. CBS offers the complete news broadcast from previous days as complete streams. CTV also offers previous days news programming, but CTV's content is divided into multiple segments that don't run sequentially in an automated way. CBS content streams at 480x360 resolution, while CTV streams at 416x312 resolution. Neither resolution is as good as that of a standard-definition TV signal, and that's typically the case with most broadband streaming.

CBS offers a 'mini' mode that retains the same video size but removes some of the extraneous web content. Both offer a full-screen mode that is truly full screen (that is, no extraneous content is displayed). Given the higher resolution of the original signal, the CBS full screen experience has a better visual quality than that provided by CTV. The CBS site, though, uses the Flash player – and that player exits full-screen mode if the user does anything in another window – a frustrating experience for users

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<sup>19</sup> A reminder: DVDs are not within the scope of this study.

with multiple monitors. CTV uses Windows Media Player and it remained in fullscreen mode in our tests.

Both newscasters use pre-roll advertising, with paid corporate advertising.

Both offer a seemingly comparable level of content to mobile viewers.

The big differentiator between the two, though, is that CBS offers free simulcasting over broadband (to U.S. viewers only) whereas CTV viewers can only see the news on the Internet after the fact. (CTV's Newsnet specialty service news channel does offer simulcasting at all times, but it's on a paid subscription basis).

Each offering has advantages and short-comings and each will provide a more satisfactory experience for some viewers than for others, depending on how and when they wish to consume the content.

### **Case study: Hockey Night in Canada**

Since 1952, Hockey Night in Canada (HNIC) has been a staple of Canadian television – and has always enjoyed high ratings.

In March, 2007, CBC announced<sup>20</sup> that “streaming of all CBC's hockey broadcasts will be available online at CBC.ca in the near future. That means fans in Canada will be able to watch any Hockey Night in Canada broadcast on CBC.ca, regardless of what game is being broadcast in their area of the country.”

CBC kicked off their simulcasting with the 2007 play-offs and has continued to do simulcasting throughout the 2007-2008 hockey season.

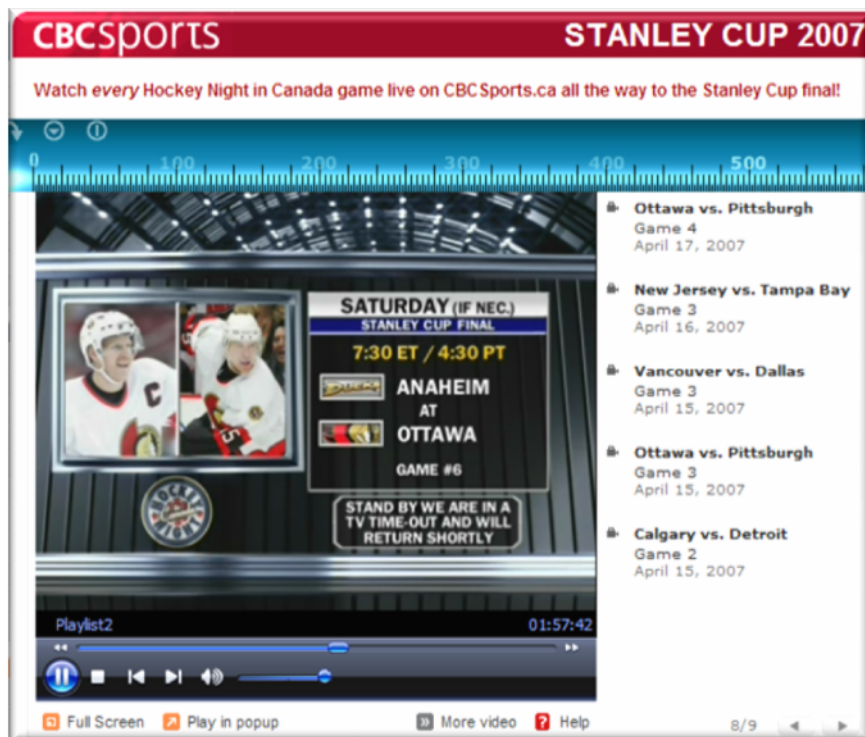
Archival content is available for last year's play-offs, and archival versions of this season's 53 games to-date, including intermission content, are, too, at <http://www.cbc.ca/sports/player/>. We did have problems viewing some of the games, and earlier during the study period no games could be found at all. The image quality is low (although on a par with most CBC broadband content) – but no doubt will improve with time.

Game highlights and other clips are also available at the HNIC website on an on-demand basis. An additional feature allows fans to create their own 'mashups' – highlight reels that they can create from available clips and share with friends and the HNIC online community.

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<sup>20</sup> See <http://www.cbc.ca/sports/hockey/story/2007/03/26/hockey-night-in-canada.html>





Surprisingly, in lieu of ads, during the live feed, and the archival play-off games, the stream stops and the player displays “Stand by we are in a TV time-out and will return shortly” while ads were running during the conventional broadcast. During replays of current-season games, though, CBC’s own ads did run (and based on the content, it’s clear that they were the ads that were contained in the original broadcast) but at other times, presumably when external ad content occurred in the original stream, the audio and video stop and only the HNIC logo shows until the unseen and unheard ad is finished.

The technical properties for a live broadcast and an archival play-off broadcast are shown below. A different, Flash-based player is used for playback of archival games from the current season, and technical specs could not be obtained – however, the image quality seemed comparable and the specs are likely similar.

We searched the Internet to see if we could determine fan reaction to this new service but came up empty. There were, however, many discussions, such as the one below, about how those outside of Canada could watch the games.



## CBC, help the ex-pat hockey fans! ■

Posted by [redacted] on Apr 15th, 2007

I'd kept hearing of [CBC putting NHL games online with streaming video](#). Well, that's true, *if you live in Canada*. I've been complaining to my fellow Canadians down here in Baltimore about how I can't get any hockey love. At this point, the only way I think I can see games live will be if a Canadian team makes it to the next round, and I'm able to watch them on the [Yahoo! NHL](#) page, which only plays US games. Needless to say, I'm sad. I wish I could get a special ex-pat code or something.

(h/t [redacted])

 Share This

 Canada  Sports

### 4 Responses

1. [redacted] Says:

[April 15th, 2007 at 6:23 am](#)

Ken,

There has to be a way to overcome this problem. You should be able to surf by proxy and appear to CBC.ca as though you're in Canada.

I know there are services for people in China to surf by proxy to evade the censorship there. I heard about it on a podcast but I can't remember the details. I'll let you know if I remember.

2. [redacted] Says:

[April 15th, 2007 at 10:48 am](#)

Michael,

I stumbled upon a link to a proxy server and it was a no-go so far. If you come across anything, be sure to let pass it along!

3. [redacted] Says:

[July 8th, 2007 at 1:07 pm](#)

I have a much better suggestion.....move back to Canada 🙄

Come on, Baltimore? Alberta is so much better.

4. [redacted] Says:

[July 8th, 2007 at 1:02 pm](#)

Thankfully, I figured out a way around the CBC streaming spots. So, my imminent move back was put off ... for now. 😊

## Patterns and anomalies

### Other common patterns observed

Most sites give the ability for viewers to share the content with others and most also include some form of search capability. The ability to rate content is also quite common.

Providing HTML code to embed the video in another web page is increasingly common, too, particularly for short-form content.

Image resolution is usually lower than that of a standard-definition television broadcast meaning that the content only looks crisp when viewed in a small window on the computer monitor. Some content is of sufficient quality to provide an acceptable experience at a monitor setting of 800x600, but most isn't.

Many players provide a button for use with Digg, a popular service that allow viewers to flag stories of interest that will 'float to the top' at Digg if enough people identify that item.

The majority of content is displayed using a player that is embedded into the web page.

More and more broadcasters are creating video portals allowing access to a wide range of their video content. Still common, though, is the program-centric approach wherein the video content for a show is available on a page dedicated to that show.

In the case of embedded players (as opposed to those that open in a separate window), banner ads, sidebar ads, and footer ads are very often synchronized to the ad content contained in the video. Even the so-called 'pop-up' players that open in their own window often also display non-video ad content above, beside or below the player (or any combination of these).

It's almost always the case that advertising can't be skipped over or 'fast-forwarded' through.

Video ad content is increasingly 'clickable', opening another browser page with additional ad information.

Although there are many exceptions, most broadcasters only make recent episodes available. This is probably done in order to avoid undermining profitable DVD sales.

Most content is available on broadband the day after it has been broadcast but that varies. Fox, for example, posts some shows within 1-2 days, but it varies by show. The popular House is only posted eight days after broadcast.

## Anomalies

The Vomments (user-created video comments) feature at The N (illustrated in the Degraasi: The Next Generation case study) offers an unusual level of interactivity with the video content. Viewers see past and real-time Vomments time-synched to the clip they are watching and can add their own as well.

Quarterlife will use broadband as the first window, with conventional broadcast coming a day or so later. See Quarterlife for more details.

Comcast announced its Fancast service in January 2008. The service promises to make vast amounts of content from the cable lineup available to its Internet subscribers over broadband, with additional interactive features and information. This offering blurs the boundaries between cable and broadband and is definitely one to keep an eye on.

## The CWbonus Feature

The CW network provided what was perhaps the most enhanced experience of any of the broadcaster websites. The player window has a CWBonus area that offers four modes of additional content – and they're all tied to the story timeline.

The first is music-related and gives viewers the opportunity to purchase music including music that is featured in the current scene. The second is fashion-related, giving viewers the chance to buy the same clothing or footwear that's being featured in the current scene. The third is gaming-themed, with quizzes and the like, again tied to the context of the story. The fourth is informative, providing background information and trivia related to what's happening or the characters on screen.



The screenshot shows a video player interface for the CW network. The top bar displays "GOSSIP GIRL MON. 8/7c" and a CW logo. The video frame shows two women in a scene. Below the video, a "cwbonus" overlay is active, titled "MUSIC FEATURED IN THIS SCENE". It features a photo of two women and the text "PRIMA J 'Rockstar'". A "More Gossip Girl Music" button is located at the bottom right of the overlay. The video player controls show "Playing 231kbps" and a timestamp of "12:48 / 40:42".



The screenshot shows a video player interface for the CW network. The top bar displays "GOSSIP GIRL MON. 8/7c" and a CW logo. The video frame shows a man in a suit. Below the video, a "cwbonus" overlay is active, titled "STYLE FEATURED IN THIS SCENE". It features a photo of a red boot and the text "Frye Nora Pull On Pebbled Boot". Below the product name, it lists "CHARACTER: Serena" and "PRICE: \$298.00". Two buttons, "BUY PRODUCT" and "MORE STYLE", are located at the bottom right of the overlay. The video player controls show "Paused" and a timestamp of "08:09 / 40:42".

GOSSIP GIRL MON 8/7c

Playing 576kbps 19:24 / 40:42

**cwbonus** GOSSIP GIRL QUIZ

How much is Serena's duck at the fancy restaurant?

- \$67
- \$95
- \$78

GOSSIP GIRL MON 8/7c

Playing 157kbps 00:40 / 40:42

**cwbonus**

**I Know That Voice**

You may recognize the voice of Gossip Girl. It belongs to Kristen Bell of "Veronica Mars."

# Appendix A Bandwidth speed tests

## Using no geo-spoofing software

### Speakeasy — Speed Test

Test your internet connection speed!

By measuring the download and upload rate from the following locations you are able to accurately measure your current line throughput or internet connection speed.

The screenshot shows the Speakeasy Speed Test interface. On the left, there is a 'CHOOSE A SERVER:' section with a list of cities: SEATTLE, WA; SAN FRANCISCO, CA; LOS ANGELES, CA; DALLAS, TX; CHICAGO, IL; ATLANTA, GA; NEW YORK CITY, NY; and WASHINGTON, DC. Each city has a 'BEGIN THE SPEED TEST' button. In the center, there is a large graphic with the number '2' and the text 'Achieve Extreme Speeds with Speakeasy ADSL2+ Speeds up to 15.0 Mbps'. Below this, there is a 'Click here to Learn More' button. At the bottom, there are two speed indicators: '14573 kbps' for download speed and '915 kbps' for upload speed. The Ookla logo is visible in the bottom right corner.

#### Last Result:

Download Speed: 14573 kbps (1821.6 KB/sec transfer rate)  
Upload Speed: 915 kbps (114.4 KB/sec transfer rate)

Results of IP address lookup:

City: Toronto  
StateProv: ON  
Country: CA

## Using commercial proxy server service

### Speakeasy — Speed Test

Test your internet connection speed!

By measuring the download and upload rate from the following locations you are able to accurately measure your current line throughput or internet connection speed.

The screenshot shows the Speakeasy Speed Test interface. On the left, there is a 'CHOOSE A SERVER:' section with a list of cities: SEATTLE, WA; SAN FRANCISCO, CA; LOS ANGELES, CA; DALLAS, TX; CHICAGO, IL; ATLANTA, GA; NEW YORK CITY, NY; and WASHINGTON, DC. Each city has a 'BEGIN THE SPEED TEST' button. In the center, there is a large graphic with the number '2' and the text 'Achieve Extreme Speeds with Speakeasy ADSL2+ Speeds up to 15.0 Mbps'. Below this, there is a 'Click here to Learn More' button. At the bottom, there are two speed indicators: '1228 kbps' for download speed and '494 kbps' for upload speed. The Ookla logo is visible in the bottom right corner.

#### Last Result:

Download Speed: 1228 kbps (153.5 KB/sec transfer rate)  
Upload Speed: 494 kbps (61.8 KB/sec transfer rate)

Results of IP address lookup:

City: Wilmington  
State: DE  
Country-Code: USA

## Using free VPN (Virtual Private Network) software

### Speakeasy — Speed Test

Test your internet connection speed!

By measuring the download and upload rate from the following locations you are able to accurately measure your current line throughput or internet connection speed.

CHOOSE A SERVER: Your IP: 38.99.101.132

- » SEATTLE, WA  
BEGIN THE SPEED TEST
- » SAN FRANCISCO, CA  
BEGIN THE SPEED TEST
- » LOS ANGELES, CA  
BEGIN THE SPEED TEST
- » DALLAS, TX  
BEGIN THE SPEED TEST
- » CHICAGO, IL  
BEGIN THE SPEED TEST
- » ATLANTA, GA  
BEGIN THE SPEED TEST
- » NEW YORK CITY, NY  
BEGIN THE SPEED TEST
- » WASHINGTON, DC  
BEGIN THE SPEED TEST

**Achieve Extreme Speeds  
with Speakeasy ADSL2+**

Speeds up to **15.0 Mbps**

[Click here to Learn More](#)

**9480** kbps

DOWNLOAD SPEED

**479** kbps

UPLOAD SPEED

[LEARN MORE ABOUT BROADBAND SPEED](#)

**Last Result:**

Download Speed: **9480** kbps (1185 KB/sec transfer rate)  
Upload Speed: **479** kbps (59.9 KB/sec transfer rate)

Results of IP address lookup:

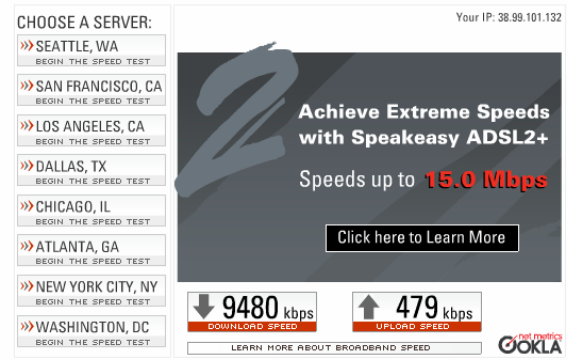
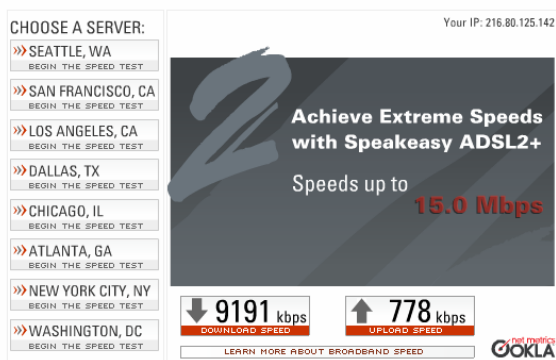
City: Sunnyvale  
State: CA  
Country-Code: USA



## Appendix B: Bandwidth control test

In order to ensure that the test results obtained from Toronto using geo-spoofing software were representative of test results that could be obtained in the U.S. by a residential broadband customer, a control test was conducted from Chicago, using *Test machine #6*, accessing the most-demanding streaming we encountered: ABC's geo-blocked HD streaming. The tables below compare those results with results obtained from Toronto using geo-spoofing on *Test machine #3*.

Bandwidth test results:



[216.80.125.142](http://216.80.125.142) = [ [216-80-125-142.snb-bsr1.chi-snb.il.cable.rcn.com](http://216-80-125-142.snb-bsr1.chi-snb.il.cable.rcn.com) ]

Residential broadband – Chicago

Residential broadband – Toronto w/ geo-spoofing

Streaming speeds:



Chicago, showing rate of 1990 Kbps

Toronto, also showing rate of 1990 Kbps

## Appendix C: Testing equipment specifications

### Test machine #1

IBM Media Centre PC

|                       |  |
|-----------------------|--|
| OS Name               | Microsoft Windows XP Professional Version 5.1.2600 Service Pack 2 Build 2600     |
| System Manufacturer   | IBM  |
| System Model          | AWRDACPI   |
| System Type           | X86-based PC   |
| Processor             | x86 Family 15 Model 2 Stepping 9 GenuineIntel ~2800 Mhz (hyper-threaded)         |
| Total Physical Memory | 3,070.48 MB  |
| Display 1:            | 24" Gateway wide-screen LCD monitor (DVI HDCP connection) @ 1920x1200 resolution |
| Display 2:            | 19" Kogi standard LCD monitor (VGA connection) @ 1280x1024 resolution            |
| Display 3:            | 19" LG standard LCD monitor (VGA connection) @ 1280x1024 resolution              |
| Display 4:            | 27" Sony Trinitron TV (S-Video connection) @ 800x600 resolution                  |

### Test machine #2

IBM Laptop

|                       |  |
|-----------------------|--|
| OS Name               | Microsoft Windows XP Professional Version 5.1.2600 Service Pack 2 Build 2600 |
| System Manufacturer   | IBM  |
| System Model          | 18695CU  |
| System Type           | X86-based PC   |
| Processor             | x86 Family 6 Model 13 Stepping 8 GenuineIntel ~1496 Mhz                      |
| Total Physical Memory | 1,536.00 MB  |
| Display:              | Internal LCD monitor @ 1024x768 resolution                                   |



### Test machine #3

HP Vista PC

|                       |   |
|-----------------------|---|
| OS Name               | Microsoft® Windows Vista™ Home Premium  |
| System Name           | HP-KIM  |
| System Manufacturer   | HP-Pavilion   |
| System Model          | GC671AAR-ABA a6130n   |
| System Type           | X86-based PC  |
| Processor             | AMD Athlon(tm) 64 X2 Dual Core Processor 5000+, 2600 Mhz, 2 Core(s), 2 Logical Processor(s) |
| Total Physical Memory | 3,069.88 MB   |

### Test machine #4

HP Media Centre PC

|                       |  |
|-----------------------|--|
| OS Name               | Microsoft Windows XP Professional Version 5.1.2600 Service Pack 2 Build 2600             |
| OS Manufacturer       | Microsoft Corporation  |
| System Manufacturer   | HP Pavilion 061  |
| System Model          | EL456AA-ABA a1328x   |
| System Type           | X86-based PC   |
| Processor (1)         | x86 Family 15 Model 4 Stepping 9 GenuineIntel ~3066 Mhz                                  |
| Processor (2)         | x86 Family 15 Model 4 Stepping 9 GenuineIntel ~3066 Mhz                                  |
| Total Physical Memory | 512.00 MB  |
| Display:              | JVC HD-52Z575A 52" LCOS 720p TV with HDCP support (DVI connection) @ 1152x648 resolution |

### Test machine #5

Apple Mac Mini

|                 |                  |
|-----------------|------------------|
| Machine Model:  | PowerMac10,1     |
| CPU Type:       | PowerPC G4 (1.2) |
| Number of CPUs: | 1                |

CPU Speed: 1.42 GHz  
L2 Cache (per CPU): 512 KB  
Memory: 1 GB  
Bus Speed: 167 MHz

Display: JVC HD-52Z575A 52" LCOS 720p TV with HDCP support (DVI connection) @ 1280x720 resolution

## Test machine #6

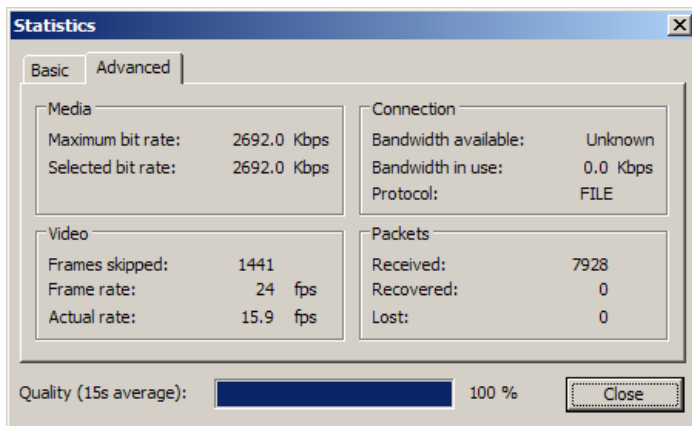
Chicago PC

OS Name Microsoft Windows XP Professional  
Version 5.1.2600 Service Pack 2 Build 2600  
System Manufacturer Dell Inc.  
System Model Latitude D630  
System Type X86-based PC  
Processor x86 Family 6 Model 15 Stepping 13 GenuineIntel ~1795 Mhz (hyper-threading)  
Total Physical Memory 2,048.00 MB

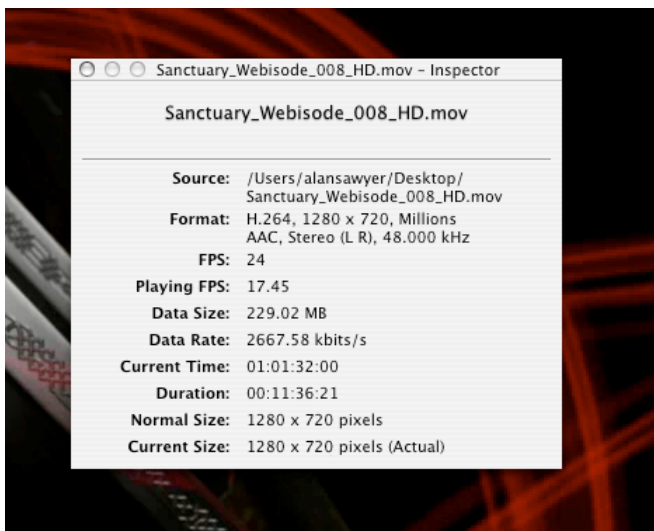
## Appendix D: Processing power requirement illustration

As a test, we downloaded an HD (720p) episode of Sanctuary and played it back on three different test machines (by working with downloaded content, on a local hard disk, we eliminate network bandwidth from the equation). This test illustrates that the demands placed upon computers by high-resolution video content are significant, and many machines aren't up to the task.

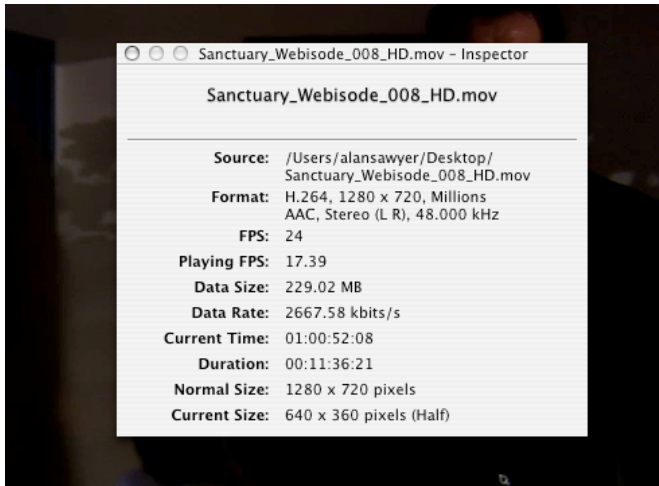
On an older Windows PC (*Test machine #1*), frames were constantly being dropped as the processor could not keep up (even when no other windows were open) as is shown below:



Our Apple Mac Mini (*Test machine #5*) experienced frame loss on playback, too,



...and even at half display size, the effect was about the same



Our most powerful test machine (*Test machine #3*) had no problem managing the task (even though many other windows were open at the same time) as is shown below (although there's an apparent discrepancy between the 'frame rate' and 'actual rate' the 'frames skipped' being zero indicates that all frames are being processed):

