

Mankato Computer Technology University

Streaming and Online Media Solutions



Streaming Media

Streaming media is multimedia that is constantly received by and presented to an end-user while being delivered by a provider.



The verb "to stream" refers to the process of delivering or obtaining media in this manner;



the term refers to the delivery method of the medium, rather than the medium itself, and is an alternative to file downloading, a process in which the end-user obtains the entire file for the content before watching or listening to it.

Cord Cutting Hits Epic Levels (Goodbye Cable, Hello Streaming)

- ▶ *The cable industry clearly has taken its time dying.*
- ▶ *Unlike the record business or print newspapers, which seemingly fell off a cliff, people have slowly abandoned their cable TV subscriptions.*
- ▶ *Known as cord-cutting, it's a process where people drop a traditional paid television subscription for a variety of streaming services.*
- ▶ *It's a phenomenon that has been happening for years, but it's accelerating.*

Cable Loses Even More Subscribers

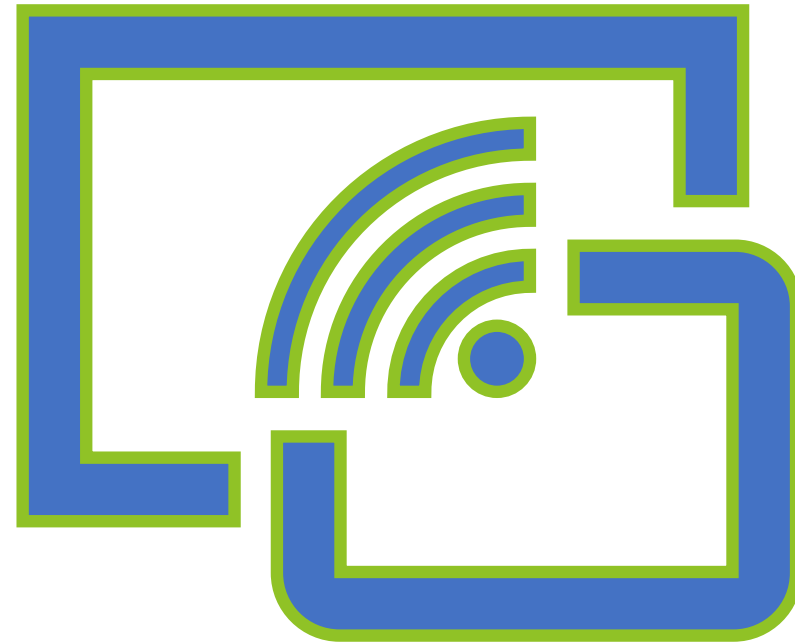
- ▶ *Cable's numbers began declining in 2014 when the industry lost just over 100,000 customers.*
- ▶ *The numbers accelerated steadily climbing over 1 million in 2017, before doubling in 2018, then again in 2019, before settling in at the current rate of around 4.6 to 4.9 million subscribers per year.*

What Is the Impact of Cable's Cord-Cutting Disaster?

- ▶ *Cord-cutting does not just impact Comcast, Charter, AT&T, and other big cable companies. It also has a ripple effect across the entire cable television industry. Essentially the traditional cable bundle serves as a sort of TV socialism. You pay for the channels you watch and the ones you don't.*
- ▶ *Content companies/channel owners get everywhere from a few cents to around \$9 per subscriber for Disney's ESPN family of channels. When people cut the cord, those channel owners get less money leading to things like ESPN laying off hundreds of people, including some big-name on-air talents and channel closures like ESPN Classic and Comcast's NBC Sports Network.*
- ▶ *As cable shrinks, niche channels become less viable. Some will support themselves via streaming services, while others will either cut their budgets or go dark altogether.*
- ▶ *That creates a cycle where your cable subscription becomes even less valuable, leading to more people cutting the cord. It's a cable death cycle, although, like print newspapers and physical records and CDs, the total will likely not hit zero (at least for a few more years).*

What is Streaming on the internet?

- ▶ Streaming video is content sent in compressed form over the Internet and displayed by the viewer in real time. With streaming video or streaming media, a Web user does not have to wait to download a file to play it. Instead, the media is sent in a continuous stream of data and is played as it arrives.
- ▶ [What is streaming video? - Definition from WhatIs.com](https://searchunifiedcommunications.techtarget.com/definition/streaming-video)
- ▶ <https://searchunifiedcommunications.techtarget.com/definition/streaming-video>
- ▶ Search for: [What is streaming on the Internet?](#)



History



In the early 1920s, [George O. Squier](#) was granted [patents](#) for a system for the transmission and distribution of signals over electrical lines which was the technical basis for what later became [Muzak](#), a technology streaming continuous music to commercial customers without the use of [radio](#).



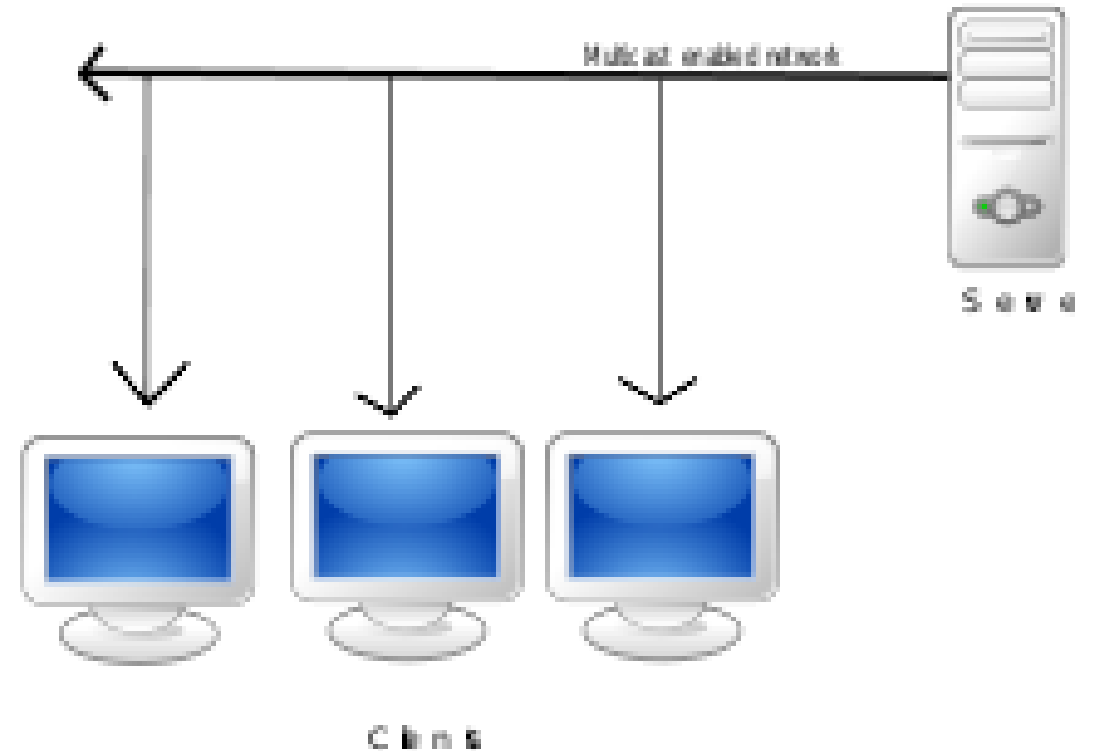
Attempts to display media on computers date back to the earliest days of computing in the mid-20th century.



However, little progress was made for several decades, primarily due to the high cost and limited capabilities of computer hardware.

History Continued

- ▶ From the late 1980s through the 1990s, consumer-grade personal computers became powerful enough to display various media.
- ▶ The primary technical issues related to streaming were: having enough **CPU** power and **bus bandwidth** to support the required data rates and creating **low-latency** interrupt paths in the **operating system** to prevent **buffer underrun** and thus enable skip-free streaming of the content.
- ▶ However, computer networks were still limited in the mid-1990s, and audio and video media were usually delivered over non-streaming channels, such as by **downloading** a digital file from a remote server and then saving it to a local drive on the end user's computer or storing it as a digital file and playing it back from **CD-ROMs**.



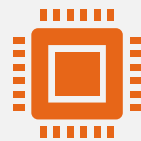
Late 90's and early 2000s



Users had increased access to computer networks, especially the [Internet](#), and especially during the early 2000s, users had access to increased network [bandwidth](#)



These technological improvements facilitated the streaming of audio and video content to computer users in their homes and workplaces.



As well, there was an increasing use of standard protocols and formats, such as [TCP/IP](#), [HTTP](#), [HTML](#) and the Internet became increasingly commercialized, which led to an infusion of investment into the sector.

The Basics

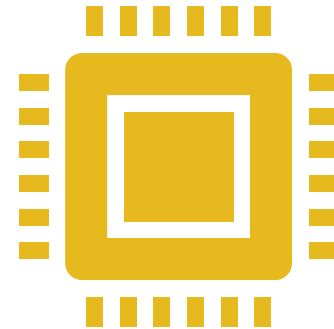
A client end-user can use their media player to start playing the data file (such as a digital file of a movie or song) before the entire file has been transmitted.

Distinguishing delivery method from the media distributed applies specifically to telecommunications networks, as most of the delivery systems are either inherently streaming (e.g. radio, television, streaming apps) or inherently non-streaming (e.g. books, video cassettes, audio CDs).

The Basics continued

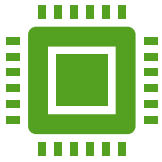


For example, in the 1930s, [elevator music](#) was among the earliest popularly available streaming media; nowadays [Internet television](#) is a common form of streamed media.



The term "streaming media" can apply to media other than video and audio such as live [closed captioning](#), [ticker tape](#), and [real-time text](#), which are all considered "streaming text".

10,000 foot view



"Streaming" was applied in the early 1990s as a better description for video on demand and later live video on IP networks first by Starlight Networks for video streaming and Real Networks for audio streaming; at the time such video was usually referred to as "store and forward video", which was misleading nomenclature.



Live streaming is the delivery of Internet content in real-time, as events happen, much as live television broadcasts its contents over the airwaves via a television signal.



Live internet streaming requires a form of source media (e.g. a video camera, an audio interface, screen capture software), an encoder to digitize the content, a media publisher, and a content delivery network to distribute and deliver the content.



Live streaming does not need to be recorded at the origination point, although it frequently is.

Basically...

- ▶ *Streaming* generally refers to the situation where a user watches digital video content or listens to digital audio content on a computer screen and speakers (ranging from a smartphone, through a desktop computer to a large-screen home entertainment system) over the Internet.
- ▶ With streaming content, the user does not have to download the entire digital video or digital audio file before they start to play it.



What are examples of Streaming?



Streaming media is video and/or audio data transmitted over a computer network for immediate playback rather than for file download and later (offline) playback. **Examples of streaming** video and audio include internet radio and television broadcasts, and corporate webcasts.



[What Is Streaming Video and Media? - Lifewire](#)



<https://www.lifewire.com/streaming-video-media-817482>

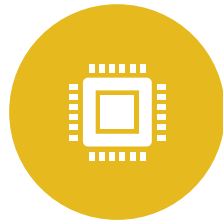


Search for: [What are examples of streaming?](#)

How does online Streaming Work?



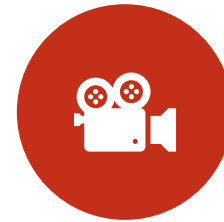
IN **STREAMING** VIDEO AND AUDIO, THE TRAVELING INFORMATION IS A STREAM OF DATA FROM A SERVER.



THE DECODER IS A STAND-ALONE PLAYER OR A PLUGIN THAT WORKS AS PART OF A WEB BROWSER.



THE SERVER, INFORMATION STREAM AND DECODER **WORK TOGETHER** TO LET PEOPLE WATCH LIVE OR PRERECORDED BROADCASTS.



[HOW STREAMING VIDEO AND AUDIO WORK | HOWSTUFFWORKS](#)



[HTTPS://COMPUTER.HOWSTUFFWORKS.COM/INTERNET/BASICS/STREAMING-VIDEO-AND-AUDIO.HTM](https://computer.howstuffworks.com/internet/basics/streaming-video-and-audio.htm)

What is a Video Streaming Service?

an on demand online entertainment source for TV shows, movies and other **streaming media**. ...

Examples of pay video streaming services include:

- ▶ Netflix,
- ▶ iTunes,
- ▶ Hulu,
- ▶ YouTube,
- ▶ Vudu,
- ▶ Amazon Instant,
- ▶ LoveFilm,
- ▶ Baidu,
- ▶ NowTV and
- ▶ Vimeo.

IS STREAMING JUST BECOMING CABLE AGAIN?

[HTTPS://WWW.THEVERGE.COM/23010559/DECODER-STREAMING-PLATFORMS-CABLE-NETFLIX-DISNEY-APPLE](https://www.theverge.com/23010559/decoder-streaming-platforms-cable-netflix-disney-apple)

- ▶ Since we are a couple years into a huge shift to streaming entertainment in Hollywood. It's clear the streamers are here to stay, while the legacy media companies are in the middle of huge transformations.
- ▶ On the one side, Apple just won the Oscar for Best Picture for a film it bought out of Sundance called CODA. Amazon now owns MGM. Netflix is investing in games and hinting at advertising for the first time.

IS STREAMING JUST BECOMING CABLE AGAIN?

- ▶ On the other side is Disney: a company with a new CEO in Bob Chapek, who is reorganizing the company around streaming — in the process, irritating big stars like Scarlett Johansson and its own major studios like Pixar by sending movies directly to Disney Plus instead of the theaters.
- ▶ But on the flip side, Encanto became a sensation only after it left theaters and hit the app.
- ▶ Quick disclosures: NBCUniversal is an investor in Vox Media, Vox Media has shows on some of these streaming platforms

What is the Best Streaming Service

In no particular order, here is a list of the pros, cons, and what to watch for each of the most popular streaming services:

Hulu...

Netflix. ...

Sling TV. ...

HBO Now. ...

Amazon Prime Video. ...

YouTube TV

<https://www.inc.com/sarah-jackson/best-tv-streaming-services.html>

Top 13 Free (And Legal) Movie Download Websites:



YouTube: ...



Crackle. ...



PopcornFlix:



<https://fossbytes.com/top-10-free-movie-download-websites-watch-legal/>



Is streaming legal

- ▶ Cable channels like HBO have their own legal **streaming** services. But beyond that, it's pretty much going to be **illegal** to stream a video. Downloading is almost always **illegal**. ... It is not **illegal** to stream a movie online.
- ▶ [Is streaming TV shows and movies online illegal? - Quora](#)
- ▶ <https://www.quora.com/Is-streaming-TV-shows-and-movies-online-illegal>
- ▶ Is streaming **movies illegal**? ... Basically, the advice from legal experts is that any service offering **free** streaming, or downloading, or to **watch movies online for free**, is probably **illegal**. The same legal situation applying to copyright material shown via TV streaming sites applies to video streaming sites.

Is it illegal to watch a movie online for free?



THE LAW, BY FAR, IS STILL UNCLEAR WHEN IT COMES TO STREAMING **FREE MOVIES ONLINE**, OR FOR VISITING **POSSIBLY ILLEGAL MOVIE WEBSITES**. WHEN YOU STREAM A **MOVIE**, YOUR COMPUTER MAKES A TEMPORARY COPY OF THE FILE ON YOUR COMPUTER. SO TECHNICALLY, YOU ARE BRIEFLY IN POSSESSION OF A **POSSIBLY ILLEGAL COPYRIGHT MATERIAL**.



[IS IT ILLEGAL TO WATCH MOVIES WITHOUT DOWNLOADING? - COMPUTER REALM](#)



WWW.COMPUTER-REALM.NET/ILLEGAL-MOVIES-ONLINE/



SEARCH FOR: [IS IT ILLEGAL TO WATCH A MOVIE ONLINE FOR FREE?](#)



Are Streaming Sites legal?

- ▶ However, if you're not downloading, or sharing the copyrighted material, accessing **streamed** content is generally **legal** for you, the user. ... Basically, the **streaming sites** are providing an avenue for accessing the illegal, copyrighted material.
- ▶ [Streaming Sites: Are They Illegal? How Do They Make Money? - Zippia](#)
- ▶ <https://www.zippia.com/.../streaming-sites-are-they-illegal-how-do-they-make-money/>

And the winners are:



SOME POPULAR
STREAMING SERVICES
INCLUDE:



THE VIDEO SHARING
WEBSITE YOUTUBE,



TWITCH AND MIXER,
WHICH LIVE STREAM
THE PLAYING OF VIDEO
GAMES;



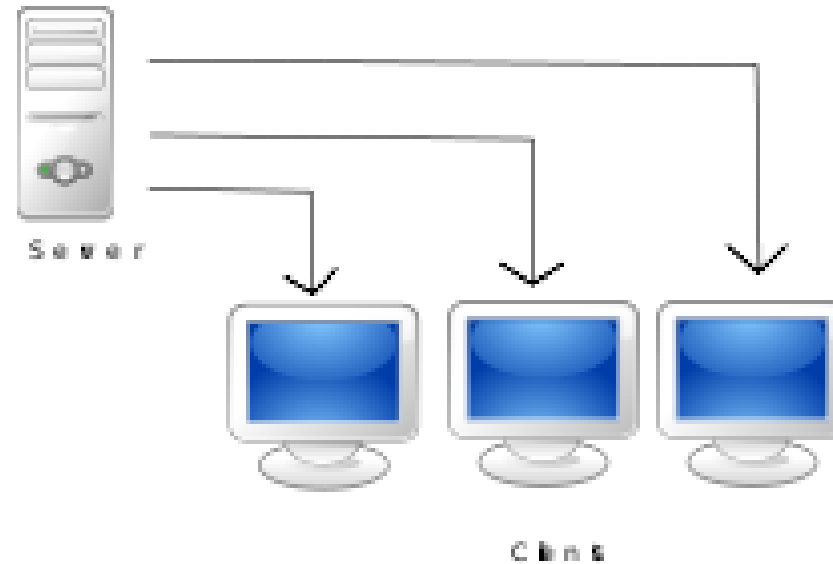
NETFLIX AND AMAZON
VIDEO, WHICH
STREAM MOVIES AND TV
SHOWS;



SPOTIFY, APPLE
MUSIC AND TIDAL,
WHICH STREAM MUSIC.

Challenges

- ▶ If the user does not have enough bandwidth in their Internet connection, they may experience stops in the content and some users may not be able to stream certain content due to not having compatible computer or software systems.



As of 2020,



a media stream can be streamed either "live" or "on demand".



Live streams are generally provided by a means called "true streaming".



True streaming sends the information straight to the computer or device without saving the file to a hard disk.



On-demand streaming is provided by a means called *progressive streaming* or *progressive download*.

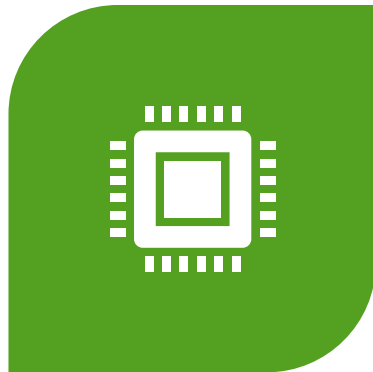


Progressive streaming saves the file to a hard disk and then is played from that location.



On-demand streams are often saved to hard disks and servers for extended amounts of time; while the live streams are only available at one time only (e.g., during the football game).

Other Applications



USEFUL - AND TYPICAL - APPLICATIONS OF THE "STREAMING" CONCEPT ARE, FOR EXAMPLE, LONG **VIDEO LECTURES** PERFORMED "ONLINE" ON THE INTERNET.



AN ADVANTAGE OF THIS PRESENTATION IS THAT THESE LECTURES CAN BE VERY LONG, INDEED, ALTHOUGH THEY CAN ALWAYS BE INTERRUPTED OR REPEATED AT ARBITRARY PLACES.

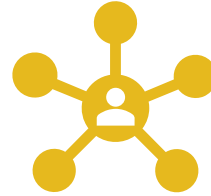


CLASSES, SEMINARS, CERTIFICATION COURSES

Streaming and Social Media



For example, sites such as [YouTube](#) encourage social interaction in webcasts through features such as [live chat](#), [online surveys](#), user posting of comments online and more.



Furthermore, streaming media is increasingly being used for [social business](#) and [e-learning](#).



Due the popularity of the streaming medias, many developers have introduced free HD movie streaming apps for the people who use smaller devices such as tablets and smartphones for everyday purposes.

Other Applications

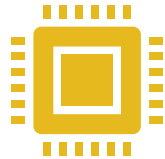


- ▶ There are also new marketing concepts. For example, the [Berlin Philharmonic Orchestra](#) sells Internet live streams of whole concerts, instead of several [CDs](#) or similar fixed media, by their so-called "[Digital Concert Hall](#)" ^[30] using [YouTube](#) for "[trailing](#)" purposes only.
- ▶ These "online concerts" are also spread over a lot of different places - cinemas - at various places on the globe. A similar concept is used by the [Metropolitan Opera](#) in New York.
- ▶ Many successful [startup](#) ventures have based their business on streaming media.
- ▶ There also is a [livestream](#) from the [International Space Station](#).
- ▶ A still from a [live stream](#) of a fish tank, Schou FishCam

Some Fun Facts



The band [Severe Tire Damage](#) was the first group to perform live on the Internet.



On June 24, 1993, the band was playing a gig at [Xerox PARC](#) while elsewhere in the building, scientists were discussing new technology (the [Mbone](#)) for broadcasting on the Internet using [multicasting](#).



As proof of PARC's technology, the band's performance was broadcast and could be seen live in Australia and elsewhere.



In a March 2017 interview, band member Russ Haines stated that the band had used approximately "half of the total bandwidth of the internet" to stream the performance, which was a 152-by-76 pixel video, updated eight to twelve times per second, with audio quality that was "at best, a bad telephone connection".

More quick facts



Microsoft Research developed a Microsoft TV application which was compiled under MS Windows Studio Suite and tested in conjunction with Connectix QuickCam.



RealNetworks was also a pioneer in the streaming media markets, when it broadcast a baseball game between the New York Yankees and the Seattle Mariners over the Internet in 1995.



The first symphonic concert on the Internet took place at the Paramount Theater in Seattle, Washington on November 10, 1995.



The concert was a collaboration between The Seattle Symphony and various guest musicians such as Slash (Guns 'n Roses, Velvet Revolver), Matt Cameron (Soundgarden, Pearl Jam), and Barrett Martin (Screaming Trees).



When Word Magazine launched in 1995, they featured the first-ever streaming soundtracks on the Internet.



<https://blog.chaddickerson.com/2005/08/29/wilco-ken-wagner-and-the-future-of-music/>