

# Streamcheck Research: News Video Quality Survey June 2002



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## Key Points

- Over 630 different video news streams were measured from CNN, MSNBC and ABC over a 15 day period. Those streams were measured 10 times per hour from 11 cities for the duration of their appearance on the news site, yielding nearly 112,000 data points.
- Although aggregate availability is in the high 90's for all sites, breaking stories are often unreachable during peak viewing hours.
- ABCNews had the lowest overall availability (97%) and the most outages: 37 streams had outages lasting 12 minutes or more.
- MSNBC had the highest and most consistent availability, with no significant outages at all.
- CNN's RealVideo streams had the best startup times (all locations averaged less than 6 seconds) and excellent availability. But their WM streams were more uncertain: 10 stories had availability below 90%. This difference is interesting, given that CNN's subscription service is operated by RealNetworks.
- Streaming quality has improved considerably since a similar study one year ago but the emergence of subscription fees means the bar must be higher. Consumers expecting dependable access to breaking stories may be disappointed depending on the site and streaming format they choose.
- Based on the data collected, Streamcheck ranks the current quality of the streaming video news sites as follows: CNN-RealVideo, MSNBC, CNN-WindowsMedia and ABC.

Rank	Site	Format	Availability (%)	Startup Time (seconds)	StreamQ™	Comments
1	CNN	RV	99.13	5.17	A+	Excellent all around.
2	MSNBC	WM	99.87	8.05	A	Availability slightly better than CNN-RV but longer startup time.
3	CNN	WM	97.21	6.16	A+	Good startup time but low availability and several outages.
4	ABC	RV	97.11	10.27	B+	Low availability, long start-up times and numerous outages. Needs work.

## Introduction

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For 15 days in June, 2002, Streamcheck conducted a survey of streaming video quality on 3 major news sites: ABC, CNN and MSNBC. With each site, we monitored the streams for the top 5 news stories (as they were presented on the site's main page). Our goal was to document the availability and streaming quality of those top stories, when viewed from cities around the world.

Key questions were:

- How reliable, in general, are these sites as a source of timely news video?
- How good – and consistent – is the streaming experience?
- What are the differences in quality and reliability among news sites?

These questions are particularly timely given the recent introduction of access fees for online video news. CNN, for one, has put all of its video news behind a monthly subscription fee. ABC limits non-paying users to low-bandwidth and time-delayed stories. Sources within MSNBC claim to be considering a subscription approach as well. In many ways, this trend is no different from the paid subscription approaches already taken by many web content sites. But whereas the accessibility of web content is rarely an issue these days, the same can not yet be said for streaming video.

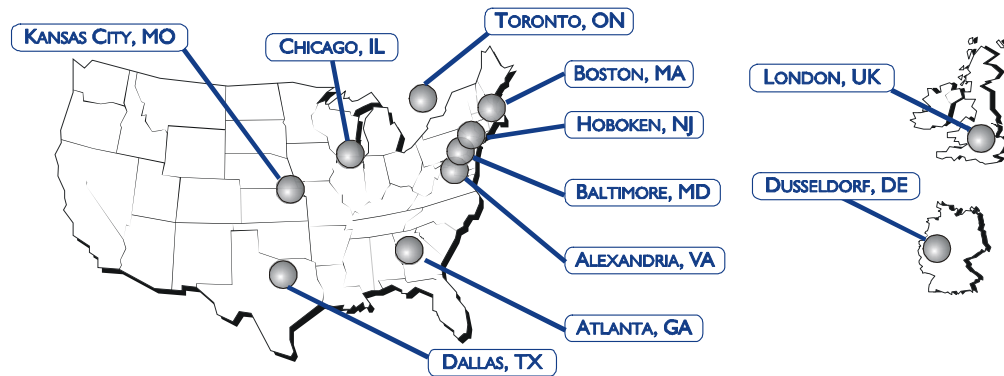
Consumers interested in getting their news video online already face a choice of different subscriptions plans. This study aims to provide, for the first time, objective data to help with that choice.

Briefly, the methodology for this study was as follows:

1. Streamcheck scanned each news site every 5 minutes to retrieve the streaming links to the top 5 news stories.
2. Once retrieved, those links were sent out to our network of measurement computers ("Scanners") located in cities throughout the US, Canada and Europe (Figure 1).
3. Each stream link was checked 10 times per hour until it no longer appeared on the page of the news site.
4. Each check of a stream lasted 60 seconds during which time key metrics (connect time, buffer time, etc.) were gathered.

In order to keep the study focused, we watched only medium speed on-demand video streams. The actual picture quality (i.e. encoding quality) was not considered at all – this is *not* a codec comparison. Of course, consumers will weigh the encoding quality along with many other factors (timeliness of the stories, quality of accompanying non-video content, variety of streams available, etc.) when deciding on a news site. This study attempts only to compare availability and the basic quality metrics of stream delivery. Further information on the methodology is presented in its own section at the end of this document.

**Figure 1: Scanner Map**



## Results

In total we performed approximately 112,000 individual checks on 636 different streams over 15 days. The results illustrate that streaming quality, in general, has increased significantly since we conducted a similar study one year ago. In fact, as figure 2 shows, stream availability was in the high 90's across all three sites. In particular, MSNBC's streams and CNN's RealVideo streams had 99% availability. Even lowest-scoring ABC had 97%. Given the high value of these numbers, one might hastily conclude that news video is "good enough" for its intended purpose.

**Figure 2: Basic comparative stats.**

"RV" denotes RealVideo format (from RealNetworks). "WM" denotes Windows Media Video format (from Microsoft). See "Methodology" section for further explanation.

Rank	News Site	Format	Availability (%)	Ave Startup Time (sec)	StreamQ™
1	CNN	RV	99.13	5.17	A+
2	MSNBC	WM	99.87	8.05	A
3	CNN	WM	97.21	6.16	A+
4	ABC	RV	97.11	10.27	B+

However, this data can be misleading in several ways. Measurements from off-peak hours invariably skew the averages upwards. Furthermore, key stories (i.e. breaking news) often have lower-than-average quality (especially availability).

For example, CNN may have a near perfect availability score in aggregate, but if you wanted to watch their breaking story "Wildfires Spread in Colorado" in Windows Media format on June 9<sup>th</sup>, you had an 11% chance of being met with an error message. For the 24 hour period ending at 3pm, June 9<sup>th</sup>, connect rates to this story from our New Jersey and Toronto Scanners were 75% and 71%, respectively. International users had long connect times on top of connectivity problems. Connect times from London and Dusseldorf averaged 5.7 and 4.6 seconds – 5 times the average for CNN. Add to this the 6 seconds typically needed for buffering and the total wait time for this story climbs above the 10 second mark.

ABC's story "Major Changes for FBI" was unavailable for over 4 hours of prime viewing time on June 18<sup>th</sup> – roughly from 11am to 2pm. ABC had recurring problems with peak time performance – stories that were available suffered long connect and buffer times (Figure 3).

**Figure 3: Startup Time for ABC's FBI story.**

This graph represents 1920 checks performed on the ABC News story "Major Changes for FBI", collected from June 12<sup>th</sup> to 20<sup>th</sup>. One can see that connect time is fairly consistent, but buffer times during peak hours are 40% longer than off-peak hours. (All times are Eastern.)

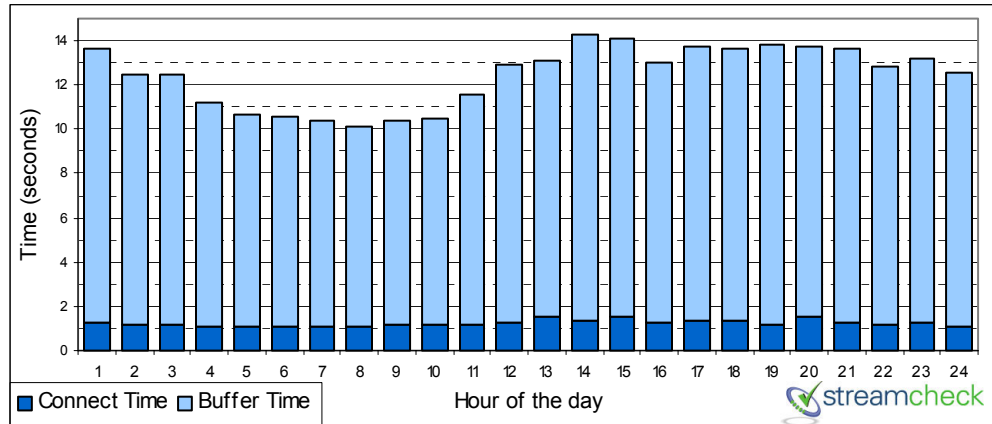
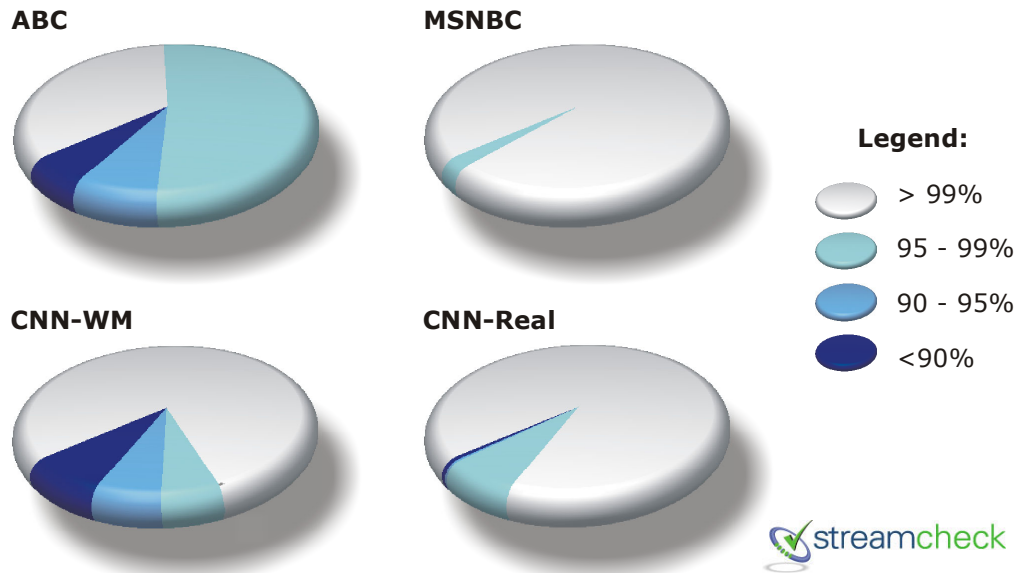


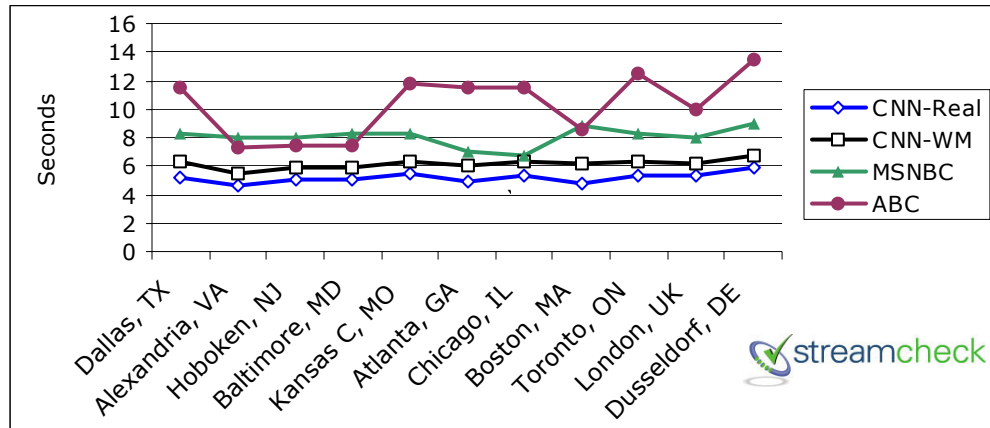
Figure 4 sheds some further light on the availability of streams at each site by grouping the availability of individual stories into 4 percentage ranges. Figures 5 and 6 show the variation of startup time and availability by geography. In general, startup times have improved greatly in the past year and are usually within 10 seconds. (To receive an A+ StreamQ™ rating, streams must have no rebuffering and total start-up time of 6 seconds or less.)

**Figure 4: Distribution of Availability Across Streams**

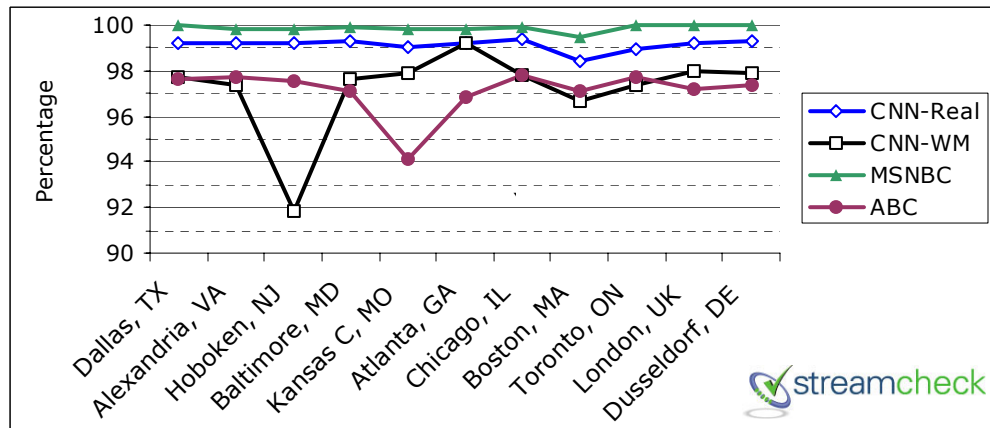
Each pie represents all the streams measured for the given news site. Each wedge represents the percentage of streams from that site that had availability in the range indicated by the wedge's color.



**Figure 5: Average Startup Time by Location**



**Figure 6: Average Availability by Location**



## Conclusions

We conclude that streaming video quality on popular news sites has improved considerably since a similar study one year ago. But the emergence of subscription fees means the availability bar must be higher. Consumers expecting dependable access to breaking stories may be disappointed depending on the site and streaming format they choose. Based on the data collected, Streamcheck ranks the quality of the streaming video news sites as follows: CNN-RealVideo, MSNBC, CNN-WindowsMedia and ABC.

## About Streamcheck

Streamcheck is the industry standard for streaming performance metrics. Our global network of measurement computers (“Scanners”) has been measuring streaming quality since August 2000 on behalf of top content owners and service providers. Streamcheck’s end-to-end measurement and monitoring solutions help customers deliver their message with consistent quality and reliability. Streamcheck offers an objective way to demonstrate quality to customers, advertisers and partners. To learn more, visit [www.streamcheck.com](http://www.streamcheck.com).

## Methodology

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Testing for this study was conducted over a 15 day period starting midnight of June 5, 2002. We examined three popular news sites that featured regular video streams of news stories: ABC, CNN and MSNBC. For each site, a “page-scraping” script was created to retrieve the URLs for the top 5 news streams. The list of active URLs from each site was refreshed every 5 minutes.

Some sites have multiple versions of the same story in different formats. We selected the URL for the “medium speed” stream from each site. These URLs had bitrates in the range of 90kbps to 220kbps. Since this study was not concerned with visual or audio quality, the difference in bitrates was not significant. ABC and MSNBC each supported only one format (Real and Windows Media, respectively). CNN had streams available in both formats, and both were measured. Thus, twice as much data collected for CNN than the other two, but that data is represented in this study as two different sets.

### Measurement

Once the stream URL was extracted from the news site, it was fed to the Streamcheck system. The methodology thereafter was *identical* to the standard Streamcheck methodology that has been in use for the last two years. Streams were measured 10 times per hour until their link no longer appeared on the news site. Each measurement (a “check”) was performed by a single measurement computer (“scanner”) watching the stream for 60 seconds while collecting the data shown in Figure 7. The key metrics used in this study are listed and described in Figure 8.

### Trimming

In total, 1710 individual streams were watched. However, we eliminated streams that were checked less than 20 times or that were available on the site for less than 2 hours. That left 636 streams, and 111,736 checks.

**Figure 7: Data Collected for Each Check**

Category	Metrics
Time Profile	Connect time, buffer time, rebuffer time, rebuffer events, number of rebuffer events.
Delivery	Server type, protocol, traceroute, error codes, average bitrate.
Packet Statistics	Packets received, packets lost.
Misc	Framerate, DNS look-up time, metafile URL, source URL.

### What we didn’t measure

This study was not concerned at all with the “perceptual” quality of the actual audio or visual content. That is, we did not measure the framerate of the video, the presence of artifacts, or the response range of the audio. These issues are certainly relevant but we believe them to be secondary behind actual availability of the content. Furthermore, such studies are invariably clouded by the subjective nature of audio/video quality measurement. Future studies may include such information.

As stated above, we only measured the top 5 “featured” news stories from each site. All of the sites offered extensive libraries of earlier material they may well be of more interest to some users than current top picks. Some sites offered audio-only streams and/or live video. These streams were not included in the study for the sake of consistency across all of the sites. Future studies may include such streams.

Further information on measurement methodology is available on the Streamcheck website.

**Figure 8: Key Metrics**

<b>Metric</b>	<b>Description</b>
Availability	The ratio of successful checks to total checks performed on a stream. A check is considered successful if playback begins within 60 seconds of the request. (e.g. A stream still buffering by the end of the check is considered a failure.)
Startup time	The sum of connect time and buffer time.
Connect time	Time to receive the first packet from the streaming server. This may include DNS lookup and metafile redirection.
Buffer time	Time between the first packet's arrival and the beginning of playback.
Rebuffer time	Time taken by one or more interruptions, after playback has begun, for further buffering.
StreamQ™	A Streamcheck metric for quickly summarizing the effects of connecting, buffering and possible rebuffer events. More information is available at <a href="http://www.streamcheck.com/streamq.php">www.streamcheck.com/streamq.php</a> .