

TWC Internet Outage Affects Millions

September 2014

On Wednesday morning, August 27, 2014, people all over the United States woke up to find that they had no Internet service. The outage lasted for hours. It turned out that a human error had taken down the high-speed Internet backbone of Time Warner Cable (TWC), terminating Internet service for millions of subscribers from coast to coast. This outage is believed to be one of the largest Internet outages to have ever occurred in the United States.



Time Warner Cable

Time Warner Cable is the second largest cable company in the United States. It provides Internet, TV, and phone cable services to 14.5 million of the country's 115 million homes in 29 states. 11.4 million of these homes and other businesses subscribe to its high-speed Internet services.

The presence of Time Warner Cable services is particularly concentrated in high-density population centers such as New York City and Los Angeles.



The Outage

A little before 7:30 AM Eastern Time, traffic on social media such as Twitter started to indicate that there were major Internet outages in California and in the Northeast U.S. These reports were all from Time Warner Cable subscribers. The complaints increased in intensity and frustration throughout the morning. It became clear that the Internet was down in large swaths of the country – in fact, wherever TWC provided service, primarily in California, the U.S. Northeast, and Texas.



Time Warner Cable Outage Chart
9:02 AM EDT

Frustrated subscribers found that they could not access TWC's web site, and TWC's call center was so overloaded that few telephone calls were being answered. However, TWC acknowledged the outage

at 7:30 AM and said that they were working to restore service.

At 9:00 AM, TWC reported that "services were largely restored as updates continue to bring all customers back online." This, of course, was not a complete restoration of services. Finally, at 11:54 AM, TWC reported that service was restored for all customers. Restoration was confirmed by an end of complaints on social media. The outage had left almost 12 million subscribers in 29 states without Internet service, in some cases for over four hours.

The Cause of the Outage

In describing the cause of the outage, TWC said that “During an overnight network maintenance activity, in which we were managing IP addresses, an erroneous configuration was propagated throughout our national backbone, resulting in a network outage.”

TWC’s national backbone provides the paths to which local and regional networks connect in order to carry Internet messages over long distances. The backbone also provides connectivity with the Internet services provided by other carriers. Without its backbone, a subscriber could not connect to any web service unless it was in his local region and was served by TWC.

It appears clear that the outage was caused by a human error. Internet networks use Border Gateway Protocol¹ (BGP) routers to interconnect their regions and to communicate with other Internet carriers. To maintain a view of the current Internet topology, BGP routers exchange with their neighbors messages that advertise new routes and that withdraw unfeasible routes. These changes quickly propagate throughout the Internet so that all routers have a reasonably current view of the Internet topology.

It appears that a routing error may have been introduced into TWC’s network during the maintenance activity, and this routing error propagated throughout the TWC network. The result was a confused network that could not reliably pass messages from source to destination.

Fined for Lack of Reporting

TWC’s quality control has come under scrutiny. Though Internet carriers are not required to disclose details of unplanned outages, they must report forthcoming planned outages.

TWC has been found by the U.S. Federal Communications Commission to be in violation of this requirement. It has fined TWC USD \$1.1 million for failing to file a substantial number of planned downtime notices.

The Proposed Merger with Comcast

As the second largest cable provider in the U.S., TWC is in the middle of an effort to merge with Comcast, the nation’s largest cable provider. The deal is valued at USD \$45.2 billion. The combined company would be in a position to provide high-capacity Internet services to two-thirds of American households without any network extensions. 29% of these households have access to only one Internet service provider. The merged company’s largest competitor would be Verizon, which would overlap just 15% of these households.

Many are opposed to the merger, feeling that it would be a threat to the future of the Internet. With little competition and no regulation, it is felt that the combined company would be able to freely increase its fees and restrict the use of its network. This is an especial concern of streaming service companies that feel that the requirement for Internet neutrality would disappear. The merged company could give priority to streaming services of its choice, limiting the bandwidth capacity of others. Netflix has already launched a complaint relative to this matter.

Another concern is that as the networks of the two companies are integrated, an error such as this one would take down the Internet for almost the entire United States. Andrew Cuomo, governor of New York, has stated that his state will investigate this outage as part of its ongoing review of the proposed merger. He notes that Internet service is vital and providers have a responsibility to deliver reliable service.

¹ *Eavesdropping on the Internet*, *Availability Digest*; March 2009.
http://www.availabilitydigest.com/public_articles/0403/bgp.pdf

If approved, the merger is expected to take place in 2015. However, it appears that there are several roadblocks in the way.

Summary

This outage is consistent with TWC's reputation among its subscribers, which is dismal at best. The American Consumer Satisfaction Index shows that TWC has the lowest satisfaction rating of any big cable provider. Of equal importance is that Comcast has the second lowest rating, just below that of TWC. This does not bode well for a cable provider that would effectively control Internet services for most of the country.

Added to this is that the U.S. ranks below other developed nations when it comes to Internet infrastructure, broadband penetration, and network speeds. In 2013, President Obama announced a plan for "Four Years of Broadband Growth" aimed at correcting this situation.

All of this emphasizes that companies must recognize that the Internet is a "best efforts" network. There is no guarantee that it will always be there to provide the customer-facing interfaces needed for its online services. As reported in many Availability Digest Never Again articles, there have been many instances of Internet failures. It is imperative that a company plan for such outages in its Business Continuity Plan. It must have a means to continue services to its customers in the event of an Internet outage.

Acknowledgements

Information for this article was taken from the following sources:

[Here's Why the Comcast-Time Warner Merger is Bad](#), *Technology Review*; April 10, 2014.

[Time Warner Cable suffers massive outage nationwide](#), *CNET*; August 27, 2014.

[Time Warner Cable Experienced A Major Internet Outage This Morning](#), *The Wire*; August 27, 2014.

[Time Warner Cable comes back from nationwide Internet outage](#), *CNN*; August 27, 2014.

[Cuomo: NY to investigate Time Warner outage](#), *Democrat and Chronicle*; August 27, 2014.

[Time Warner Cable Experienced Outages in all Markets Wednesday](#), *Wall Street Journal*; August 27, 2014.

[Time Warner Cable Experiences a Major Internet Outage This Morning](#), *The Wire*; August 27, 2014.

[Time Warner Cable Internet Outage Affects Millions](#), *Vanity Fair*; August 27, 2014.

[Massive Internet Outage Points to Flaws in Policy and Technology](#), *Technology Review*; August 28, 2014.

[What caused Time Warner Cable nationwide cable outage? Probe underway](#), *Tech Times*; August 28, 2014.

[For Time Warner Cable, more network means more problems](#). *Fortune*; August 28, 2014.