

Cloud Storage Slowing the Network

HOW CAN ONE COMPUTER BRING MY NETWORK TO A CRAWL?

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SUMMARY

The race is on. Vendors are offering free cloud storage if you will use their site. Google says, "Come to us, we'll give you 15 GB of free storage." Purchase Office365 and Microsoft offers 1 TB of storage. Acer, Acronis, and many more are doing the same. It's almost too good to be true.

In addition, many day-to-day operations are moving to cloud-based management:

- student information systems (SIS) or school management systems (RenWeb, Power-School)
- wireless access point installation and management
- security camera/system monitoring and management
- HVAC monitoring and management
- photocopier monitoring and management
- yearbook creation (Jostens' Yearbook Avenue)
- professional online backup (Backblaze, CrashPlan)

So what's the catch?

DESCRIPTION

You just upgraded your Internet connection from your Internet Service Provider (ISP). They are giving you 10 Mbps upload (upstream), and a blistering 100 Mbps download (downstream) speed. You grin as you think all your problems regarding response time to your users have been solved. Then you start getting complaints. The network is still slow; sometimes it takes a minute or more to load a page; software installations fail. What is going on?

The typical connection offered to consumers and small businesses is asymmetrical. As the Internet initially developed, it was determined that download speed was much more important than upload speed. As a result of this philosophy, asymmetrical speeds were provisioned. Most of the available bandwidth was given to the download. On face value, this made sense. A search request to Google (upstream) only takes a few bytes. The response Google returns to the end user (downstream) can be in the 10's or even 100's of kilobytes. What the early designers did not take into consideration was the advent of cloud storage. Why is this important?

The Internet uses a protocol called TCP/IP. The protocol is based on packet technology. As packets come in from the downstream, their receipt must be acknowledged back to its origin using the upstream. With cloud storage, and some cloud-based management services, the entire upstream bandwidth becomes full (saturated). This slows down the acknowledgment packets that must be sent upstream—before additional downstream packets can be received. This scenario can literally bring a network to a crawl.

RESOLUTION

Best practices would suggest that cloud storage is banned on your network—except under your direct supervision. If it must be allowed, then it should only be done during off-peak time (i.e., nights and weekends). But what if this is not possible?

CONTINUED

If your ComSifter is the gateway router on your network (it connects to the cable/DSL modem) then there is something you can do—utilize Quality of Service (QOS). QOS allows you to prioritize based on ports, IP addresses, and—most important to this discussion—packet size. Even if you decide setting up ports and IP addresses is too difficult, that’s okay. Just turning on QOS will prioritize small packets—and that is what we want to do to alleviate the saturated upstream problem.

Note: Utilizing QOS is only useful for Internet traffic, and is not meant for bandwidth usage over the local network. To manage local network bandwidth, managed switch(es) are needed to prioritize ports and any devices connected to those ports.

ComSifter Setup

Before turning on QOS there are two pieces of information you need: your true downstream, and true upstream speeds—not the speeds advertised by your ISP.

Note: This is best done early morning, late evening, weekends, or anytime your network is unused.

1. Run a speed test using a test server closest to your location. Do the test 3–4 times to make sure you get consistent reading, using any one (1) of the following:
 - a. <http://www.dslreports.com/speedtest>
 - b. <https://www.speakeasy.net/speedtest>
 - c. <http://www.speedtest.net>
 - d. <http://speedtest.xfinity.com> (for Comcast customers)
2. Login to the ComSifter and go to `Network > QOS`.
3. Enter the speeds (in Kbps) from Step 1 in the `Up` and `Down` boxes. (No other information is necessary.)
4. Under `Enable QOS`, choose the `Yes` radio button.
5. Click `Execute`.

You’re done. Small packets will now have priority over large packets.

Note: Detailed information regarding QOS in ComSifter User Guide (page 3-79 for CS-8D Pro units). Be sure you fully understand how utilizing the remaining area of QOS can affect your network. Incorrect advanced usage can do more harm than the basic usage of QOS as outlined above.

SIDE EFFECTS

If you suspected that you had a saturated upstream and you enabled QOS, you should see faster response times. If you do not see any improvements, then you have other problems.

There are no known operational issues with QOS, but any changes in your Internet connection—especially the upstream speed—should be monitored. QOS uses the upstream speed to determine how to prioritize packets.

Example: You had a 10 Mbps upstream connection. This speed was entered into QOS on the ComSifter. An upgrade to the service from the ISP now provides a 20 Mbps upstream speed. No improvement would be noticed until the upstream value was updated in QOS.

A previous technical service bulletin (*QOS Alert* — March 15, 2012) provides a similar explanation, and can be found at <http://www.comsift.com/tsbs.htm>.