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'Last mile' would be the bottleneck, as students vie with workers at home

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Could the H1N1 flu virus give networks a bad case of congestion? It could if workers and students are forced to stay home because of the pandemic.

Officials at the U.S. Government Accountability Office weighed in on the potential for clogged networks Monday in a 71-page report (download PDF); Gartner Inc. analysts reiterated the GAO's concerns yesterday.

Although the issue has been raised before by various ISPs and network carriers, recent worries have focused on securities firms that depend on third parties to clear trades and process payments over the Internet, according to the GAO. "Internet congestion during a severe pandemic that hampers teleworkers is anticipated, but responsible government agencies have not developed plans to to address such congestion and may lack clear authority to act," the GAO warned.

Gartner picked up that GAO theme and offered some technical tips for businesses grappling with the problem. Work-at-home strategies for organization "may be in jeopardy as residential Internet bandwidth supply may not meet demand," Gartner said.

Both Gartner and the GAO, as well as other groups, have consulted with ISPs, carriers and large carrier consortiums on this issue, and have noted that Internet backbone congestion from a pandemic is not a major concern. The larger problem may be with the network "edge" or "last mile" in the residential portion of the Internet.

The last mile is a generic name often used for the wired connections between homes and carrier switching offices, often a mile or so away from a group of homes.

Al Berman, executive director of the Disaster Recovery Institute in New York, agreed, saying there could be congestion problems for workers who work at home without the right equipment. He urged companies to do stress testing on their private networks.

Gartner said that dozens of residential DSL users could share a single DSLAM connection at the carrier's switching office to reach the backbone, contributing to congestion problems. "Last-mile DSL and cable modem networks are where remote access falls apart," said John Girard, a Gartner analyst. "Backbones will be affected [some], but the network edge will crash."

While the network edge impact would vary by neighborhood, Gartner based its comments on a Centers for Disease Control planning guideline that assumes 40% of the workforce may be out of the workplace for an extended period of time during a pandemic.

In some ways, Gartner went further than the GAO in airing concerns about network readiness, although the focus of Gartner's comments was on businesses -- not how the government should work with businesses.

Gartner analyst Roberta Witty said that current work-at-home strategies being implemented by organizations to deal with pandemic-related network congestion "will likely not work" in a true emergency. She recommended that IT groups work with network service providers to decide in advance which business operations require heavy Internet use. Companies may even need to stagger hours of operation to increase chances of getting needed bandwidth.

Gartner suggested three ways businesses can improve bandwidth for work-at-home employees during a pandemic:

- Consider deploying WAN optimization controller software on every laptop used at home to mitigate bandwidth and latency problems. Such software can reduce the bandwidth needed for many applications by 80% to 90%.
- Install client applets that work with data center application delivery controllers or with WAN optimization controller software to reduce network performance bottlenecks.
- Bypass the wired last mile by switching to a wireless connection such as 3G or Wimax or satellite. Even so, Gartner said to assume that wireless services might also be overused in an emergency.

The GAO's report is far borader, and indicates that service providers could add extra network capacity, install direct lines to businesses, temporarily reduce maximum transmission rates or shut down some Internet sites. But all those methods are limited by technical difficulties and whether the government has the authority to insist on such moves.

The GAO asked several government agencies to comment on its report, and included a response from the Department of Homeland Security (DHS) that went on for several pages. In one portion, DHS urged all Internet users, including financial services, to develop pandemic contingency plans.

"An expectation of unlimited Internet access during a pandemic is not realistic, any more so than an expectation that traffic congestion on hurricane evacuation routes can be completely avoided," the DHS wrote. "All users which rely on the Internet, including the financial services sector, should not expect that Internet congestion problems will be easily solved...."

Computerworld*'s Lucas Mearian contributed to this story.*