

RETAILERS, ARE YOU ADDICTED TO BANDWIDTH?

Experts say there's a little-known cure!



INTRODUCTION

IP Multicast technology can improve network performance, reduce monthly costs, and enable you to break the endless cycle of adding expensive bandwidth to fix a sluggish network.

“Unless you are a top retailer, you’re likely chasing the pack. That means, you try to mirror what the big dogs are doing, even if you don’t have the capital to keep building a bigger and bigger network. A retailer will quickly run out of bandwidth and not have ways to optimize the bandwidth performance they do have,” explains Steve Swartz, former chief engineer at a Fortune 500 retailer with more than 40 years of experience.

That leads to bandwidth addiction and a series of common workarounds.

Unfortunately, most retailers assume adding bandwidth is their only option. They are also so accustomed to workarounds that they hardly realize other options exist.

Here we explore some reasonable and cost-cutting options to break the bandwidth addiction cycle and reduce workarounds. Namely, **moving from IP Unicast to IP Multicast technology to reduce monthly expenses, streamline the time to deliver content, lower multimedia costs, and provide higher network availability.**

The Curse of the Common Workaround

As Mr. Swartz notes, many retailers feel pain points without even realizing it, and they deploy workarounds to alleviate that pain. One of the most common efforts involves keeping antivirus software updated and individual workstations current. Antivirus software contains virus definition files that are massive in size. As a result, it's not feasible to perform antivirus updates during regular business hours. Doing so would paralyze the network and make it unavailable for back-office or point-of-sale transactions. Retailers work around this by performing these updates overnight or during non-business hours. Again, because of large file sizes, retailers know that scheduling updates for a small handful of stores and workstations all at once, works best. Too many simultaneous transmissions will overload the network.

Another common workaround is to dispatch an IT professional with a thumb drive or disk loaded with the new software updates to each store. This approach requires identifying reliable local resources and coordinating onsite efforts, such as determining when a store is quiet enough that workstations can be taken offline for the update, or, performing those updates after closing hours, which may add to the expense.

Each day the virus files are not updated, the risk of cyber theft and intrusion increases. Virus files must be updated often just to stay ahead of cyber criminals. Today, any type of fraudulent activity that compromises a network has real consequences for a retailer's brand and the customer's privacy.

From the retailer's perspective, these types of routine processes—which are actually workarounds designed to accommodate insufficient technology—are common.



The Myth of More Bandwidth

To combat these and other issues, retailers often try to increase bandwidth, only to discover that it does little to solve the issue, and the workarounds continue.

Why exactly doesn't adding bandwidth have the desired effect?

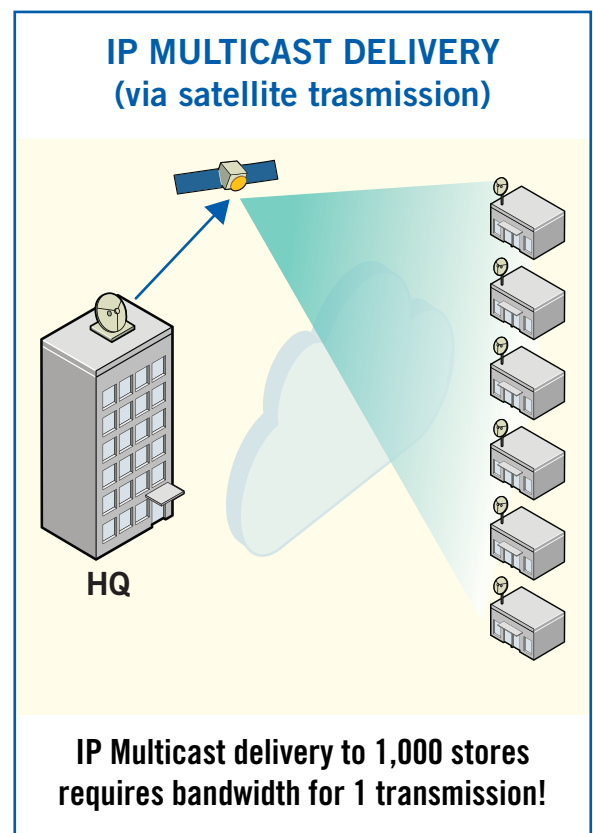
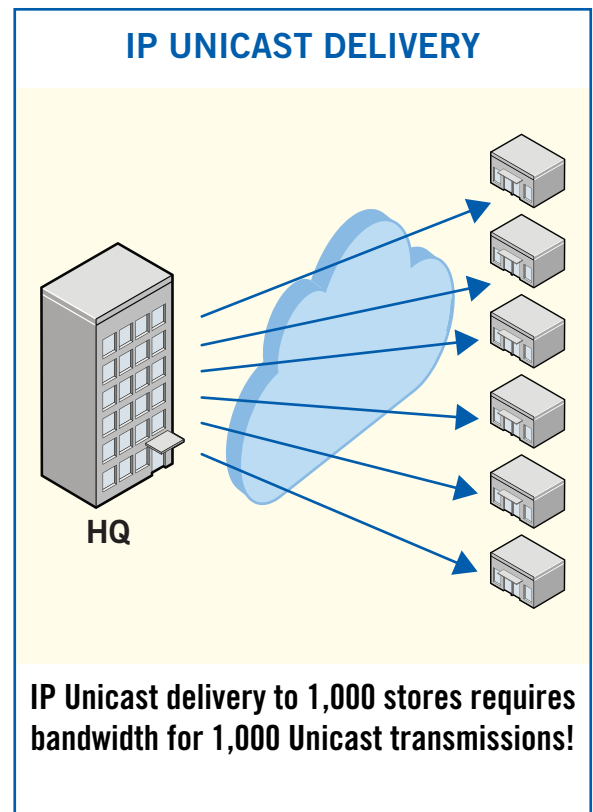
Enter the concept of IP Unicast—the term to describe how traffic is routed in and out of a network. Unicast is a one-to-one transmission from one point in the network to another, or from one sender to one receiver, each of which is identified by a network address. With unicast, individual packages of information or files are queued up and sent from the server through the network to each workstation before the next package can be sent.

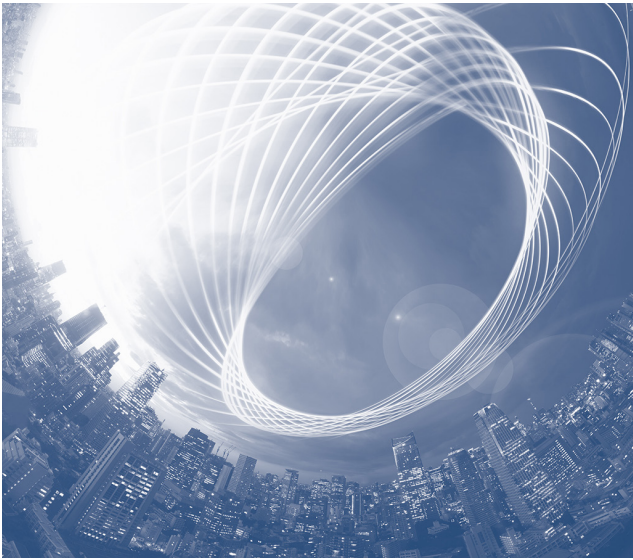
Now, consider both virus definition file size and the number of workstations—let's say 500 to 1,000—in a moderately-sized retail operation. Queuing up enough bandwidth to support these hundreds of unique streams is both a horrific waste of bandwidth and a great way to cripple the system.

Unfortunately, as indicated by Mr. Swartz, “few retailers even realize that their network relies on unicast routing or that they face this particular challenge.”

Enter IP Multicast

The good news for retailers is that there is a solution: IP Multicast, which transmits data to multiple recipients simultaneously. It routes data in a way similar to sending a single email to a group of people or distribution list. With multicast, the time to deliver data is dramatically reduced when compared to delivering one file individually to every workstation or system, as unicast does.





Comparing Apples to Apples

A side-by-side comparison of unicast versus multicast routing, with speed being equal, is the best way to see the tremendous differences between the two. Let's consider a retailer with 500 store locations, each of which has two Microsoft Windows 10 (MS Win10) workstations (for a total of 1,000 systems).

The retailer needs to update the Symantec Endpoint Protection antivirus definition file with the latest version (SEP 14) on all systems. That means sending it to each remote workstation on the network over 1.5 Mbps links. The IT department decides to run the update between midnight and 6:00 a.m.

How long will each update take?

Sending the SEP 14 file (170 MB) to 1,000 Windows Workstations	Unicast	Multicast
Transmission Size	170 GB	170 MB
Duration	52 days	20 minutes
Speed Upgrade at the Central Site	1.5 Gbps	1.5 Mbps

It will take the unicast transmission 52 days, where as multicast requires only a 20-minute transmission time! By comparing these methods within the context of a real-life scenario, it's easy to see why retailers are forced to find workarounds. It's also readily apparent how much risk they face during the time spent trying to schedule and coordinate upgrades of their definition files.

In order for the transmission times to match, the central networking site that uses unicast routing would need to be upgraded from 1.5 Mbps to 1.5 Gbps. That would include replacing the primary and backup links and switch ports, installing an upgraded router and firewall, and upgrading to SEP servers with 10 Gbps interfaces, along with more processing power and memory. If a retailer maintains a data center disaster recover site, then the upgrade costs double.

Let's look at another scenario: an attempt to upgrade the operating systems of 1,000 Windows workstations across the network. This should be able to be accomplished by sending a fully embedded Microsoft Windows 10 OS image (MS Win10) that is a 10.5 GB file to all workstations.

How long will each update take?

MS Win10 Scenario: 10.5 GB File to 1,000 Windows Workstations	Unicast	Multicast
Transmission Size	10.5 TB	10.5 GB
Duration	8.9 years	3 days
Speed Upgrade at the Central Site	Not an option	

It will take the unicast transmission **8.9 years** to complete! (Will those systems even be operational by that point?) Contrast this with a 3-day transmission time associated with multicast.

In this situation, there is no feasible solution to upgrade speeds and infrastructure at the central site to match the multicast delivery time. Only multicast provides the ability to move files of this magnitude because it can roll out a system upgrade across an entire chain quickly and essentially create a network of new systems. With the swift pace of technology change and the migration to the Cloud, completing OS upgrades in a timely manner is critical for organizations to be able to run their back-office and enterprise applications.





Benefits Beyond Time-to-Deliver

By utilizing multicast technology rather than unicast, a retailer will immediately realize improved time-to-deliver benefits. In addition to antivirus and OS full image system updates, multicast can impact business requested application enhancements, as well as routine database updates or full database refreshes.

Multicast can also better support multimedia and real-time rich media content, without requiring the need to continually install expensive equipment at each store location. With the ability to leverage cheaper hardware, retailers can more easily deploy everything from in-store video training content to overhead music and advertisements.

Perhaps the greatest impact happens when multicast is coupled with satellite technology to offer the highest network availability in the industry. Satellite can also serve as a back-up link to enable locations on the network to quickly recover from outages, such as those experienced following a disaster or even construction accident. Additionally, multicast paired with satellite technology can further reduce monthly expenses significantly, with added savings if it is incorporated into a LAN/WAN corporate campus.

BENEFITS OF MULTICAST

Improved Time-to-Deliver

Faster file transmission helps eliminate downtime, delays, and inconvenient processes.



Reduced Monthly Expenses

Reducing bandwidth and central hardware requirements results in reduced monthly expenses.



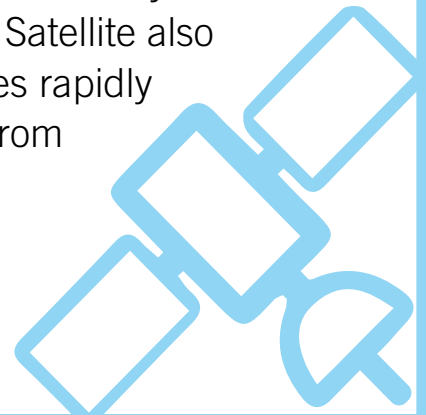
Lowered Multimedia Costs

Using cheaper hardware lowers support costs (for example, IPTV).



Increased Network Availability

Improved time-to-deliver coupled with satellite technology offers the highest network availability in the industry. Satellite also helps sites rapidly recover from outages.

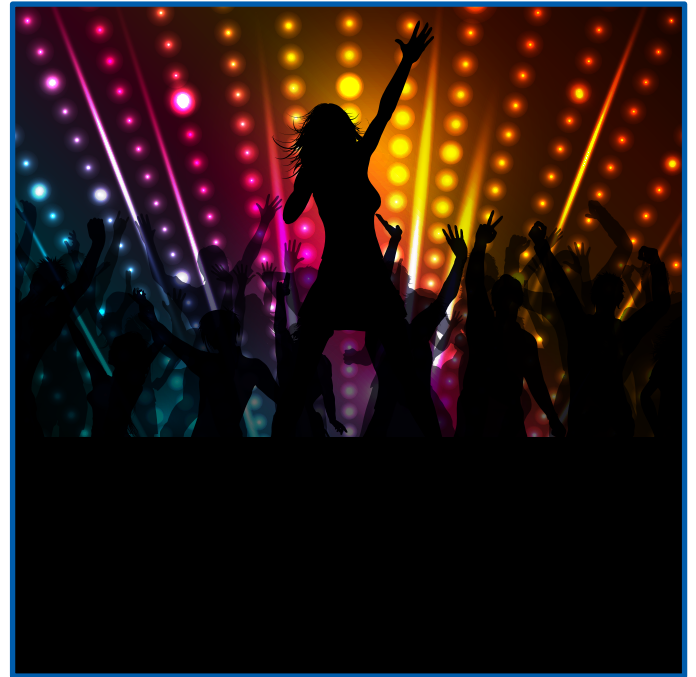




UNICAST

“1-to-ONE”

- Unicast networks work like a “call center”
- Individual transmissions (calls) are sent from sender to each receiver
- More capacity is needed to make more “calls” simultaneously
- Bandwidth increases linearly to scale from a single site to 100s or 1,000s



MULTICAST

“1-to-MANY”

- Multicast-enabled networks work like a “concert”
- All receivers are simultaneously updated from the sender
- Very efficient for content distribution
- Multicast via satellite saves bandwidth, backend infrastructure, and time
- Bandwidth scales from a single site to 100s or 1,000s

ARE YOU ADDICTED TO BANDWIDTH?

Ask the Experts

Retailers can assume, based on their experience transmitting antivirus updates or the number of workarounds they consistently employ, whether they have unicast or multicast technology in place.

“They can also recruit the right IT expertise and a provider who is equipped to assess their network technologies, as well as whether the network relies on traditional broadband or perhaps a blend of terrestrial and satellite connectivity,” advises Mr. Swartz. “They’ll bring in engineers who can recommend a path forward and enable the retailer to move from unicast to multicast technology.”

Enhancing the network in this way will optimize its performance and allow a retailer to break the endless cycle of adding expensive bandwidth to improve slow file transmissions, which positions the organization to reap a host of other cost-saving benefits.

Want to learn more?

If you would like to learn more about multicast, look for these materials online:

- **Product Overviews:** Literature by leading network hardware manufacturers (such as the Cisco IP Multicast technical overview).
- **Standards:** To understand IP Multicast standards, refer to IETF RFC 5110.
- **IP Addressing:** To understand IP Multicast addressing, check out the summary on Wikipedia.

**For additional information, please call 1-888-440-7126
or visit business.hughes.com.**



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