



Whole Foods Grows Network Visibility for Smoother Operations

Founded in Austin, Texas, in 1980, [Whole Foods Market](#) is a multinational natural foods retailer with more than 500 stores in North America and the United Kingdom. A USDA Certified Organic Grocer, the company is a wholly owned subsidiary of Amazon, Inc.

Industry

Retail

VMware footprint

- VMware Edge Network Intelligence™
- VMware SASE™

Whole Foods Market relies on the smooth flow of data running on wireless networks to manage its stores and distribution centers. But connectivity problems yield lost sales, distribution problems and, ultimately, customer dissatisfaction. Whole Foods launched a solution built on VMware Edge Network Intelligence that provides the company with a true picture of network health. The VMware SASE solution enables IT staff to quickly root out and resolve the causes of application connectivity and network problems.

Network visibility keeps food on the table

Founded in 1980 in Austin, Texas, Whole Foods Market revolutionized the natural grocery business, with more than 500 stores in North America and the UK. Acquired by Amazon in 2017, the company integrates technology into every aspect of its operations, from stores to warehouses to management systems. The company needed a comprehensive picture of its networking infrastructure. Point solutions provided a partial picture of network health, but this incomplete picture led to lost sales, bottlenecks in the flow of goods, a significant investment of IT resources, and worst of all, unhappy customers. To keep its systems working smoothly, Whole Foods needed an interoperable, comprehensive monitoring solution to integrate systems from both vendors and in-house providers from Whole Foods and Amazon.

“The nice thing about having VMware Edge Network Intelligence is that we can quickly tell if a problem is really a wireless problem, or if we need to start looking for answers in a different place.”

Paul Jorgenson, Senior Network Development Engineer, Whole Foods Market



Gaining the whole picture of system status

Physical retailers rely on in-store wireless networks, and Whole Foods is no exception. Guest Wi-Fi, order flow for prepared food, product picking for online orders, and warehouse barcode scanning at distribution centers all rely on the company's wireless networks. Integrating these systems is crucial. Without a view of the big picture, the company lacked visibility into system status, from malfunctioning applications to network failures. "We would have to do manual pings and checks, packet captures and analysis, depending on the severity of the situation," says Paul Jorgenson, senior network development engineer, Whole Foods Market. "We really had no way to know what our latency was to our application servers, or even which app servers were involved."

"They always say it's a wireless problem, even when it isn't," says Jorgenson. "But the nice thing about having VMware Edge Network Intelligence is that we can quickly tell if a problem is really a wireless problem, or if we need to start looking for answers in a different place."

For example, Whole Foods launched a trial program to enable customers to order prepared foods at point-of-order stationary tablets. When the application developed connectivity problems, customers were unhappy with the experience, stopped using the tablets, and sales dropped. Without network visibility, Jorgenson and his team spent hours troubleshooting application failures, wasting precious time, and yielding few improvements.

Healthy networks help yield healthy food

Guided by analyst reports and industry rankings, Whole Foods engaged VMware® to develop a proof of concept using VMware Edge Network Intelligence. "We liked what we saw," says Jorgenson. "Then we did a wider rollout." VMware Edge Network Intelligence now runs on the networks of more than 450 Whole Foods stores and six of its 10 distribution centers. A comprehensive rollout to all its locations is underway.

"Once we had VMware Edge Network Intelligence," says Jorgenson, "I looked up the subnet for devices reported for wireless issues. I looked at every device and clicked through a few of them. Each had absolutely perfect signal-to-noise ratios, unbroken graphs, great metrics." Once Jorgenson and his team could determine the true source of the failure—not in the wireless network—they could solve the problem quickly. "That's the difference in having visibility," says Jorgenson. "You don't have to guess and just throw solutions at the wall."

VMware Edge Network Intelligence helped Jorgenson solve a problem with handheld wireless point-of-sale scanners. He spent two weeks on site troubleshooting the system. "I had to manually set packet captures with a server, a cable and a span port, correlating events, looking at round-trip times to try to understand the problem," says Jorgenson. App optimization provided a partial resolution, but the scanners began having latency issues that affected even more stores, slowing operations. "We expended a tremendous effort to identify the source of the latency," he says. "I collected all the endpoint information for every app on the scanners, figuring out all the communication with endpoints, ports and protocols."

"Once we had VMware Edge Network Intelligence, I looked up the subnet for devices reported for wireless issues. I looked at every device and clicked through a few of them. Each had absolutely perfect signal-to-noise ratios, unbroken graphs, great metrics. That's the difference in having visibility. You don't have to guess and just throw solutions at the wall."

Paul Jorgenson, Senior Network Development Engineer,
Whole Foods Market



Network intelligence serves system upgrades

Jorgenson loaded the profiles into VMware Edge Network Intelligence and created a library of all apps in use. The team began noticing spikes in TCP round-trip times and was able to correlate those spikes with stores with lower-bandwidth circuits. Whole Foods was able to use that data to justify accelerating circuit upgrades at stores, ultimately restoring normal operations. During the scanner diagnosis, Jorgenson and his team noticed that when a certain app was not set up correctly, it would send 20–30GB of log data per day, which exacerbated the circuit utilization problem. “That problem was not caught by in-band monitoring tools,” he says. “I was able to catch it because VMware Edge Network Intelligence works out of band as well. That was another big win.”

Jorgenson compared VMware Edge Network Intelligence with other tools he has used to monitor network health: “Other monitoring tools have a hard time telling you what network clients are doing. They might give you a list of IP or MAC addresses, but they’re not going to show you the average round-trip time to a specific server over the past two weeks. And that’s probably the most powerful thing about it.”

Preserving resources to save time across the enterprise

Whole Foods deployed VMware Edge Network Intelligence as a virtual image, eliminating the need for additional hardware at store locations. “Now we can put VMware Edge Network Intelligence on our network stack without physical hardware or staff on site. It’s easier to deploy, and the installation has gone smoothly,” says Jorgenson. “VMware Edge Network Intelligence has saved me and my team at

least 200 hours over the last year because we’re not chasing problems that we have no data about.” The team experienced the same savings of time and effort with the wireless scanner issue. “That issue affected almost every store. With VMware Edge Network Intelligence, we identified and fixed the problem nine months faster than we otherwise would have. Without that feedback, we might still be trying to find the root cause,” he says.

“VMware Edge Network Intelligence has saved me and my team at least 200 hours over the last year because we’re not chasing problems that we have no data about. With VMware Edge Network Intelligence, we identified and fixed the problem nine months faster than we otherwise would have. Without that feedback, we might still be trying to find the root cause.”

Paul Jorgenson, Senior Network Development Engineer,
Whole Foods Market

Expanding network visibility for the whole picture

Moving forward, Whole Foods plans to deploy VMware Edge Network Intelligence at its corporate offices to help the company diagnose why audio and video calls drop or experience jitter and lag. The company anticipates integrating the solution with other VMware products to generate even more useful data about device performance, and to better analyze, correlate and resolve issues.

“I would definitely recommend VMware Edge Network Intelligence to other retailers,” says Jorgenson. “It’s excellent. I don’t know of any other tools that can tell, from an outside perspective, how your apps and your endpoint devices are doing. With other tools, you can set metrics inside your app and your infrastructure, but sometimes that doesn’t give you the whole picture that you need.”