



A family-owned and operated company, [Nature Fresh Farms](#) is one of the largest vertically integrated leaders in greenhouse-grown produce in North America. The company is committed to advancing greenhouse innovation and sustainable food security to provide healthy, quality and environmentally friendly produce.

Industry

Agriculture

VMware footprint

- VMware SD-WAN™
- VMware SD-Access™
- VMware Edge Network Intelligence™

A Growing Business: Nature Fresh Farms and VMware SD-Access

Nature Fresh Farms is successfully standardizing its greenhouse growing methods using AI and edge computing. The company uses VMware SD-WAN, VMware SD-Access, and VMware Edge Network Intelligence to process and monitor the flow of data at the edge—and the tomatoes have never been better.

Technology for growth

Founded in 1999 in Leamington, Ontario, Nature Fresh Farms was built with computing in mind from the start. “Our first greenhouse had a computer in the middle that could control events such as irrigation. It was unheard of at the time,” says Keith Bradley, vice president of IT, Nature Fresh Farms.

The company, with more than 200 employees, now grows tomatoes, cucumbers, peppers and strawberries on more than 250 greenhouse acres in Canada and the United States. Nature Fresh Farms still relies on technology to assist growers. These modernized methods produce the best possible vegetables.

“Installation on the 5G robot was simple and easy. VMware SD-Access started to flow data right back to our data center without a problem. The data started to move quicker, and we saw a lot less latency between the robot and the cloud. It didn’t need a VPN connection or its own SD-WAN hardware appliance.”

Keith Bradley, Vice President of IT, Nature Fresh Farms



The mathematics of plants

Plants, as it turns out, can generate a tremendous number of data points. Nature Fresh Farms has nearly 200,000 sensors placed throughout greenhouses and is adding more constantly. The growers use this data to understand plant growth and take better care of the plant, such as trimming it back if it's producing more fruit than the vine can support.

"At the edge, we process everything from how much light the plant gets, the weight of the vine, how much water is injected into the plant, the nutritional value of the water before it goes in, the nutritional value after it goes out, the volume that goes out, how much CO2 is in the air in that area," says Bradley.

The company also uses AI systems to grade each vegetable by parameters including size and color. Color indicates ripeness, and an AI camera can distinguish between small color variations. The result is consumers get better, more consistently flavorful produce.

The AI systems use the data to provide the plants, and Nature Fresh Farms staff, with everything they need to grow produce at peak quality. Using VMware Edge Network Intelligence, Nature Fresh Farms can process and better understand the data coming from hundreds of thousands of sensors. "It has helped us understand and look for latency issues in our IoT devices," Bradley says. "VMware Edge Network Intelligence helps us understand potential issues before the growers even notice. We can prevent network problems from affecting plant production."

Easy connectivity across far-flung locations

Bradley estimates that Nature Fresh Farms grows about 1.8 million plants across all its facilities. Each plant generates approximately 25GB of data per month. VMware SD-WAN moves this tremendous flow of data from the edge to the core. "Of that 25GB, about 12GB is sent to the core for processing, and the rest is processed on databases at the edge," says Bradley.

Nature Fresh Farms connects an expansive network of greenhouses and growers with VMware SD-WAN. The solution's built-in LTE 5G option offers a level of flexibility and confidence that allows for deployment in rural areas that would be challenging for a traditional terrestrial network. Bradley adds that VMware SD-WAN lets the company choose between using a cloud solution to upload the data or allowing data to go directly back to the core, depending on the origination point.

"Our goal was to make all our locations feel like they're right next door to each other, whether they are in Ohio or Canada," says Bradley. "The speed and ease of use of VMware SD-WAN is really helping us accomplish that goal."

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Introducing VMware SD-Access

When Bradley and his team learned that VMware was about to introduce a software-based remote access option, Nature Fresh Farms was among the first to trial it. VMware SD-Access brings together two areas Bradley is passionate about: connectivity and security. Bradley says, "Traditional VPN was not good for us. Every time we added a VPN into our growing network, it seemed to open up other problems. VPNs also increased network noise that would increase latency. Noise always reduces our time to get readings from the plants, which affects plant growth."

VMware SD-Access was the first solution that did not add network noise or affect latency for Nature Fresh Farms. On the security front, Bradley says that “through the VMware SD-Access connector feature, we’ve finally been able to allow our growers from the outside world to access that secured network because our growing network is physically separated from the production network. We don’t even VLAN it off. Now they can see the data in closer to real time than ever before. It’s one of the best features we’ve been able to give to the growers.”

VMware SD-Access has proven useful in several cases. The solution is installed on a 5G-enabled scouting robot that examines and tracks the fruit and color of each pepper plant, letting growers know the ideal time to harvest.

“Installation on the 5G robot was simple and easy,” says Bradley. “VMware SD-Access started to flow data right back to our data center without a problem. The data started to move quicker, and we saw a lot less latency between the robot and the cloud. It didn’t need a VPN connection or its own SD-WAN hardware appliance.” Bradley also noted that Nature Fresh Farms is rolling out VMware SD-Access to multiple workstations, providing much more connection flexibility to employees.

Nature Fresh Farms runs a mobile [Greenhouse Education Center](#) that travels to retail stores, summer camps, and schools showing consumers how greenhouse vegetables are grown. VMware SD-Access has turned out to be an integral piece of technology for the project. The company recently expanded the mobile greenhouse. In addition to showcasing innovative growing methods, Nature Fresh Farms also demonstrates the AI-enabled systems that adjust factors such as lights and irrigation.

“When we initially set up connectivity for the mobile center, we couldn’t flow data quickly enough to really show off the AI capabilities,” says Bradley. “Now instead of one 5G connection, we can individualize three 5G connections. Each VMware SD-Access client is installed on a Dell VxRail device with three 5G cards, so each node has its own bandwidth. VMware SD-Access will help us get the data back to our main AI core for the fast processing we need.”

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Plans for a flourishing partnership

Now that Bradley and his team have learned more about VMware SD-Access, they can get connections up and running within an hour to a few hours, depending on the use case.

“We can make changes on the fly so quickly,” says Bradley. “You can start to use the software out of the box right away. It’s not a long-term time investment to start, and the learning cycle is even quicker now than it ever has been for an SD-WAN solution. I haven’t found anything that’s this secure and this simplified right now. I’ve seen other simple solutions, but I’ve never seen enough security that allows me to have the confidence that it’s safe to use.”

For Nature Fresh Farms, this remarkable technology is the way forward. The company’s ongoing partnership with VMware ensures the continual growth and evolution, opening up new possibilities for the future of agriculture.