CASE STUDY

French Broad EMC Protects Rural Customer Connectivity

FRENCH BROAD
ELECTRIC MEMBERSHIP CORPORATION

Industry | Telecom

When private electric companies refused to deliver their services to Madison County, North Carolina as it was not economical, community members set about to provide electrical service to the under-served areas. In 1939, the electric cooperative French Broad Electric Membership Corporation (EMC) was born.

The cooperative now provides electricity to 40,000+ accounts for their members. With the advent of broadband, the same negative economic arguments were made by mainstream providers against rolling out to rural locations. French Broad EMC once again stepped in to answer the call, bringing vital connectivity services to the region to address the rural internet digital divide.

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>
> — Devin Rice
> Network Engineer, French Broad EMC

Network Solution

A10 Thunder CGN

Critical Issues

- Needed to grow customer base
- Stop unexpected service outages
- Mitigate DDoS attacks against IPv4 address pools
- IPv4 address exhaustion limited company's expansion potential

Results

- Prevented customer service-affecting outages
- Eliminated manual intervention to mitigate DDoS attacks
- Enabled customer base to scale rapidly through efficient use of public addresses
- Facilitated rural internet adoption
- Estimated CAPEX savings of 50-79 percent
- ROI achieved in less than one year

The Challenge of Growth

French Broad EMC established a pilot project based on its own internal network that the team redesigned to support a fiber-to-the-home solution. It was initially a simple setup with basic network address translation (NAT).

By the time the customer base reached 1,000, the network was beginning to show the strain. In addition, regular DDoS attacks against IPv4 addresses in assigned address pools meant the team had to manually isolate whole network blocks to avoid disruption to the entire network. Then they had to wait for attacks to stop before manually re-adding the affected address block back into the NAT pool.

At the same time, the service took off faster than expected, and with more customers coming online, the company decided that a full network redesign was needed. More robust architecture and carrier-grade network address translation (CGNAT) were essential to ensure the business could reach its 15,000 customer target while providing a reliable, cost-effective service. It was at this point that the company realized their existing allocation of IPv4 addresses would not be sufficient to meet this growth.

Selection Criteria

French Broad EMC needed a solution with strong scalability and excellent longevity. "We don't want to redesign our network in five years because of unexpected exponential growth," said French Broad EMC Network Engineer Devin Rice.

The business also needed a solution to solve the issue of IPv4 address exhaustion. “As a small rural ISP, we only had a few public address blocks. CGNAT allowed us to efficiently use the few addresses we had access to," said Rice.

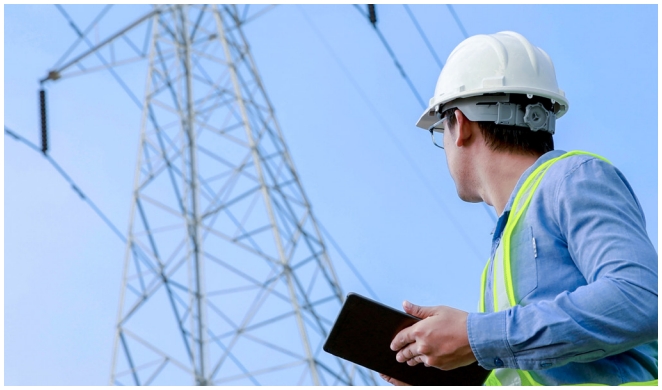
Automated DDoS protection for the IPv4 address pools was another key selection factor. In the early setup, French Broad’s upstream service provider had a throttle set up for DDoS protection and if an attack took place, they would kill the line. As Rice points out, this affected more than just the specific DDoS target. He said, “Maybe someone was being paid to take out a player that is doing great on a video game (with a DDoS attack), but we might have 20-60 customers in the same pool sharing that public IPv4 address. Those customers were affected with loss of service until we could go in manually — whatever the time of day or night — and move customers off of that block until the attack was resolved, and then move them back.”

Advanced logging features were also an advantage as French Broad EMC must comply with copyright infringement cases and law enforcement requests.

French Broad EMC Selects the A10 Thunder® CGN Solution

The company deployed two A10 Thunder CGN devices providing high-performance carrier-grade NAT and integrated DDoS protection, enabling the business to maximize the efficiency of IPv4 addresses, robustly defend NAT IP address pools from DDoS attacks, and protect service availability for subscribers.

The Thunder CGNs were part of the wider network redesign, which involved a learning curve for the French Broad EMC team. “When we redesigned the network we went from a Volkswagen to a Ferrari. It was a complete overhaul and we integrated these Thunder CGNs in the middle so there was complexity involved, but the solutions themselves were not complicated to set up. With the giant overhauling that we did, the Thunder appliances were the simplest by far in terms of complexity, in part due to the helpfulness and knowledge of the A10 onboarding team,” explained Rice.



The Results

The A10 Thunder CGN's integrated DDoS protection is a standout feature for French Broad EMC. It seamlessly detects and protects against DDoS attacks, shutting down problematic addresses and substituting new ones. It ensures uninterrupted uptime without manual intervention. As Rice explains, "Having that versatility and reliability, with the automation behind it, means I'm not having to get up at 3:00 a.m. to figure out what's going on. Customer satisfaction is up, and my satisfaction is up and those are the two most important things!"

The efficient use of IPv4 addresses facilitated by the Thunder CGN is also a big win for French Broad EMC. "Now we can have multiple people sharing one address using different ports. As we continue to grow, we're less concerned about obtaining new and expensive public address blocks. With CGNAT, we should have plenty to pull from. This gives the business the scalability it needs to meet future growth," said Rice.

French Broad EMC has deployed two appliances and found that failover testing between them was straightforward and efficient. "Redundancy is often a pain point that works in theory, but not in practice," Rice notes, "but we rebooted the primary device and dropped maybe a single packet before failover to the second – it works like a charm." This reliability also pays dividends with any firmware updates required. "We can update one to new firmware, and apply it with a simple reboot. While the primary is down, the secondary picks up the customer traffic without skipping a beat. We can quickly update both devices in sequence without customers being impacted, in the middle of the workday — for someone like me managing the network, that's a huge plus," said Rice.

But perhaps the biggest win is the time saved. Says Rice, "Before, we were spending several hours per month dealing with DDoS attacks and customer-impacting network issues. This has now been completely mitigated by implementing the A10 solution."

Now, the setup is so effective and reliable that DDoS attacks aren't as troublesome. "If it is not service-affecting and is not a problem, then I don't have time to look at it," said Rice. "Attacks were regular when we started, maybe one or two per week, but since we've implemented A10 Thunder CGN, we're down to one every few months. If it weren't for the email notification of the event, I wouldn't even know the attack took place. The A10 CGN solution handles the transition automatically, the customer never knows it happens, and our network isn't impacted."

The A10 solution has become a reliable component of the French Broad EMC infrastructure. It's been a "set it and forget it" scenario. Says Rice, "My favorite part about the day-to-day of using A10 Thunder CGN is that it's not day-to-day…there are very few times that I'm going into the A10 system because we have a network issue."

Success and Next Steps

Investment in A10 Thunder CGNs has paid off rapidly as the subscriber base has grown with the company's rural internet initiatives. Rice also estimates a 50-79 percent CAPEX savings, and ROI achieved in less than a year.

The company is now well-positioned to grow its fiber-to-the-home service and deliver world-class connectivity to rural customers. The initial target is to reach 15,000 subscribers and there are already more than 7,000 residents who are online with a reliable, protected service thanks to the efforts of French Broad EMC and the A10 Thunder CGN solution.

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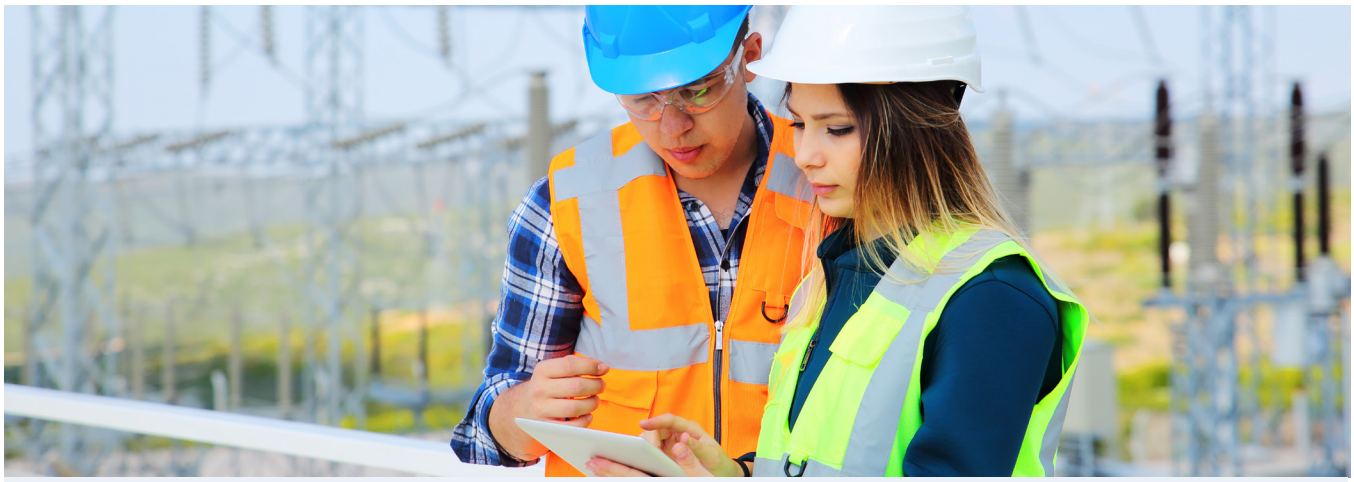
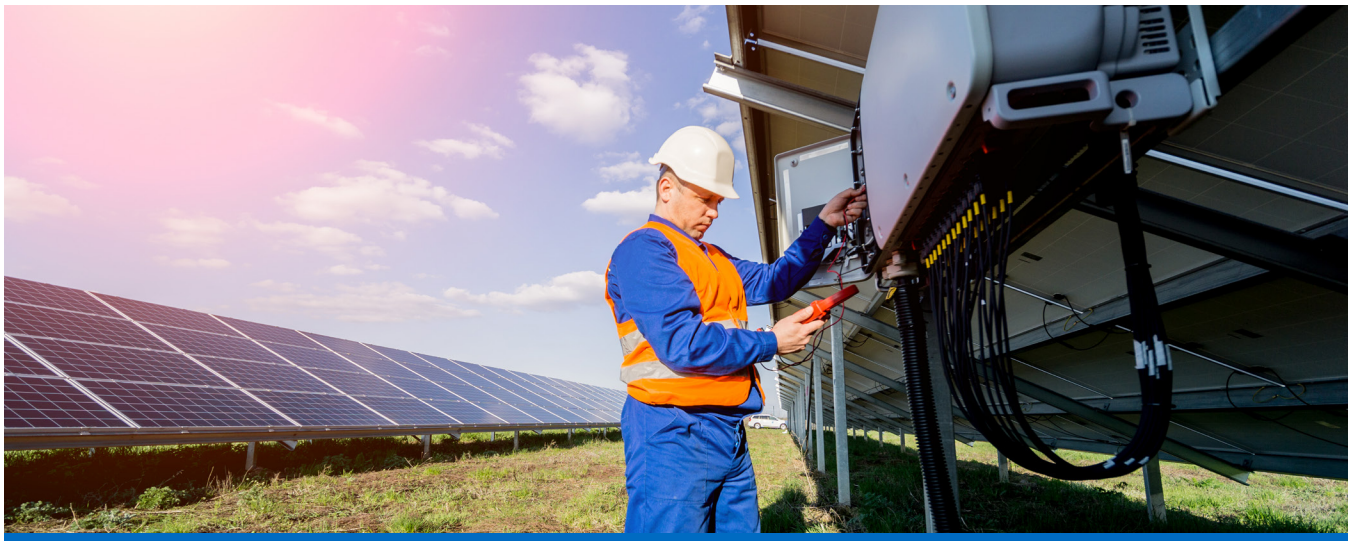


About French Broad EMC

Founded in 1939 in Madison County, North Carolina, French Broad EMC is an electric cooperative that provides electrical service to rural communities. The company now has more than 22 substations, serving more than 40,000 in four counties in western North Carolina and two in eastern Tennessee. The company also provides high-speed internet services to more than 7,000 members.



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Part Number: A10-CS-80227-EN-01 Nov 2022