

Case study

AI technology for smart buildings takes cellular route from edge to cloud

BRAINBOX AI



ERICSSON

Image courtesy of BrainBox AI

BrainBox AI devices use Ericsson Cradlepoint routers for cellular connection that enables automated HVAC adjustments

Customer:
BrainBox AI

Industry:
Building automation

Use Case:
IoT sensors

Success story highlights

Challenge — BrainBox AI's innovative technology helps building operators automate their Heating, Ventilation and Air Conditioning (HVAC) systems, reduce greenhouse gas emissions, and save money. A big part of this process is ensuring the flow of that valuable data from the building to the cloud is never interrupted. The company needed a wide-area network (WAN) solution that is independent from the on-site, wired ISP.

Solution — BrainBox AI leverages an Ericsson Cradlepoint cellular router in each building within the company's portfolio, enabling a "bring your own network" approach that can be replicated time and time again — and centrally monitored and managed from anywhere through Ericsson NetCloud Manager.

Benefits — With compact IoT routers integrated into this powerful smart building product, BrainBox AI has an easy-to-deploy LTE connectivity solution that combines ideal form factor and simplicity with enterprise-grade reliability, performance, and manageability.

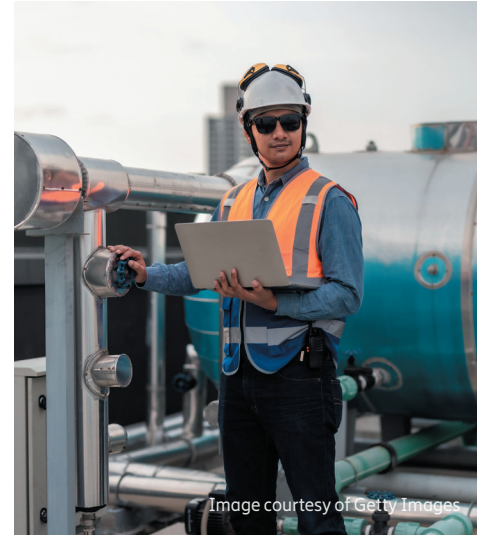


Image courtesy of Getty Images

"Using a building's wired Internet to communicate with our cloud solidifies dependence on infrastructure outside our service offering — we have no way to support if it goes down. Ericsson Cradlepoint cellular router we control the uptime of our technology."

Hartin Code, director of operations and head of client success, BrainBox AI

Background and challenges

BrainBox AI is an exciting new leader in the world of building automation. Headquartered in Montreal, Canada, the company's advanced artificial intelligence technology for HVAC systems uses deep learning, cloud computing, and custom algorithms to proactively optimize the energy consumption of buildings.

BrainBox AI's devices and software gather and analyze data from a building's HVAC system, which includes components such as fans, chillers, and boilers. HVAC is connected to the building management system on the local-area network (LAN). This information is combined with external data, such as present and future weather conditions, and then fed through the cloud to BrainBox AI's prediction models, which are driven by deep learning. After analysis, the AI sends instructions by writing back directly to the HVAC system — with no need for human intervention.

"Our system improves efficiency with frequent and granular changes unique to each building's behavior and not replicable by manual control. The AI frees up operators to focus less on

mundane temperature complaints and more on higher-value management projects," said Hartin Code, director of operations and head of client success at BrainBox AI.

This fully autonomous solution, which was recognized as a TIME Best Invention of 2020, significantly reduces carbon emissions and saves money. It's a world-changing product that can only thrive consistent network connectivity. Data transport from host buildings to BrainBox AI's private cloud data centers can be challenging.

Dependence on site's network connectivity

Originally, BrainBox AI leveraged whatever on-site ISP connection was available from each host building. However, the company quickly discovered the variance across sites was slowing down deployment. Plus, the limitations of guest-level access left BrainBox AI's IT team wanting additional control.

"We were at the mercy of someone else's network and security decisions, which led to unexpected connection downtime and painful lessons. Every time we lose connectivity, we have to triage. We have to get in touch with the

client and sometimes their contractors. It's very manual. Alleviating any of those events is extremely beneficial to our operations," Code said.

Small space requiring powerful router

BrainBox AI's hardware enclosure is compact, which restricts the size of the WAN solution that can be used. Not many routers have a form factor small enough yet with features sophisticated enough to meet the requirements of this company's elegant AI tool.

Scalability for rapid growth

Also, BrainBox AI sought widespread expansion of its HVAC automation system, thus could not afford to be limited by the deployment and network management limitations of its WAN solution. The company needed highly scalable routers that support cloud-based visibility and adjustments.

"Scalability has always been a huge factor for our business, especially early on. We have to ask, 'What would we do if this problem was 100x or 1,000x?'" Code said.

Solution

BrainBox AI uses Ericsson Cradlepoint routers for the centrally managed WAN connectivity necessary to consistently send HVAC data from buildings to the cloud, where the company's AI engine resides.

The company deployed IoT routers which fit nicely in BrainBox AI's small and sleek units. Along with an array of actionable insights from



Image courtesy of iStock

dashboards ranging from cellular health to data security, Ericsson NetCloud allows centralized in-band management of devices on the LAN.

Benefits

High-performance, enterprise-grade LTE connectivity

For BrainBox AI, the ability to standardize data transport by using LTE instead of each building's ISP has given them the autonomy and control they need to keep their systems running all the time.

Centralized network management

Ericsson NetCloud Manager makes it easier for BrainBox AI to set up LTE connectivity quickly and monitor it from far away, which supports business goals and expansion plans. The team also uses NetCloud's LAN Manager feature; they can connect to and manage almost any device that has an IP address on the LAN — without any additional software or hardware.

As BrainBox AI's solution continues to evolve, many additional centralized monitoring and management features are waiting to be activated through NetCloud.

"We are scratching the surface of using this solution. The software stack allows us to extend with remote monitoring and setup in a beautiful way," said Frank Sullivan, chief business development officer at BrainBox AI.

Flexible data security options

Initially BrainBox AI pivoted to LTE for one reason: the interrupted transfer of data to the cloud. However, as the team began looking into the architecture of cellular networks through Ericsson solutions, it became clear they could improve their data security, too.

"We realized the possibility of using private APNs and of layering on our VPNs. Actually, 99% of the time, what we have with LTE is more secure than what we would have had through a building's ISP," Code said.

"Every time we would lose a wired connection provided by a building, we had to get together with various parties. Using the Ericsson Cradlepoint routers to alleviate those downtime events is exponentially better."

Hartin Code, director of operations and head of client success, BrainBox AI

Learn more at [cradlepoint.com](https://www.cradlepoint.com)

