

Building a Common Edge Platform and Specification with EdgeX Foundry

CHALLENGE

In early 2022, Eaton surveyed open source IoT/edge platforms looking for an edge framework. One that could help them rapidly deliver intelligent edge applications for their [Brightlayer Edge](#) Linux-based hardware platforms. Eaton’s electrical business is a global leader with deep regional application expertise in power distribution and circuit protection; power quality, backup power and energy storage; control and automation; life safety and security; structural solutions; and harsh and hazardous environment solutions. Through end-to-end services, channel and an integrated digital platform & insights Eaton is powering what matters across industries and around the world, helping customers solve their most critical electrical power management challenges.

Eaton had an internally developed and maintained Linux application platform that was monolithic in nature and needed to be specialized for each product team. Product teams needed a modernized, micro-service based way to rapidly develop their applications around a common core and allowed for incorporation of new protocols, cloud connectivity and analytics.



Eaton’s legacy solution required specialization for each hardware product. Each hardware device had its own customized software solution based on a monolith platform – adding up to additional costs and maintenance challenges.

Eaton needed an edge platform – a software defined gateway – that was more flexible, easier and less costly to maintain, addressed legacy as well as new system needs, and would provide more uniformity across products. Eaton chose [EdgeX Foundry](#), an [LF Edge](#) project, after looking at a number of open source and proprietary alternatives available on the market today.

Eaton was searching for an embedded Linux edge platform and selected EdgeX because of a couple of key criteria:

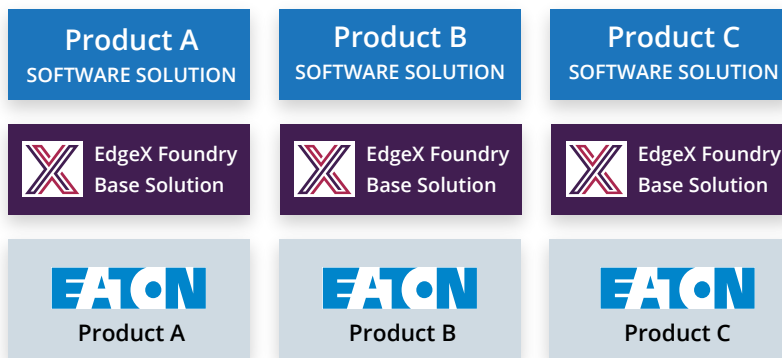
- EdgeX was light weight and efficient. Many of the other platforms investigated were written in higher-level languages like Python and Java.
- EdgeX was modular and flexible. The other platforms that were primarily C/C++ seemed to lack the modularity of a microservice and event driven architecture that Eaton was driving for.

SOLUTION

Eaton’s Digital Hardware Enablement Team created a common edge platform to help their product teams more easily and quickly create market specific software applications.

The common edge platform based on EdgeX is

- able to address a wide range of product requirements (both legacy and new)
- a toolkit of ready-made edge components that can be picked from by the product development teams, yet still adhering to a defacto product standard and common architecture
- event-driven, micro service architecture for flexibility and ability to compose new solutions from parts
- option for containerized applications providing more straightforward deployment and application updating
- allowing 3rd party elements, like edge analytics, to be easily incorporated/integrated
- reducing developer training time compared to the experience with the legacy platform
- backed by a community that can be leveraged for platform services and extensions



EdgeX provides Eaton with a common, open, standardized base edge platform – allowing product teams to focus on product specific applications

EdgeX was designed in a way that was important to Eaton. The EdgeX community has a strong understanding of what Eaton calls “embedded edge compute”– the ability to support resource-constrained hardware was critical for Eaton. Some examples of where the flexibility of EdgeX were beneficial:

- During the EdgeX integration, Eaton identified some services that exceeded the selected hardware capabilities. The flexible nature of EdgeX allowed Eaton to work with the community to devise smaller services in some areas, like security and configuration management, that simply replaced existing EdgeX services.
- The initial portfolio of products required Modbus, BLE and BACnet device protocol support – all of which EdgeX provides. Eaton also supports proprietary IoT connectivity and has future needs to support additional Northbound protocols including BACnet, Modbus, Ethernet IP, OPC-UA and a host of electrical infrastructure protocols. Eaton appreciated the fact that the EdgeX SDK architecture creates a clear path for the development of additional north and south connectivity services which can be easily shared among product teams.
- Eaton’s Center for Intelligent Power, a team of data scientists based in Dublin, is responsible for analyzing edge data, creating/growing algorithms to derive insights to help enhance efficiency and optimize power management. This team was adamant on the need to be able to dynamically deploy analytics to the edge. Eaton’s EdgeX-based, micro-service, containerizable edge platform now provides the Eaton analytics teams the ability to “bring your own analytics” and change them rapidly as new discoveries are made.

Eaton’s common edge platform is still being rolled out among the product development teams. There is a focus now on moving the organization toward this solution that allows teams to leverage the common platform to meet their specific application needs. Some example product types leveraging EdgeX include IoT gateways, industrial control products and uninterruptible power systems.

According to the Eaton team, **“EdgeX promotes or even creates a central / open standard architecture to build around. This is probably the ‘biggest win’ – a common specification for combining all the services and applications together.”**

Eaton is already seeing that the new platform accelerates development and reduces training time in comparison to the legacy platform. Eaton’s common edge platform has become a “rally point” for Eaton engineers to accelerate product development and facilitate code reuse.

Eaton is already contributing back to the EdgeX community and has been elected to the project’s Technical Steering Committee. Eaton’s use of EdgeX in commercial products while giving back and helping to grow the open source ecosystem is the epitome of the Linux Foundation and [LF Edge](#) (the umbrella project to which EdgeX is a part).

EDGE X FOUNDRY™

Get involved Edge Foundry is a highly collaborative, innovative, and growing open source edge platform with a community of users, developers, and contributors. [Here are the resources](#) you need to be part of it.