Using Open Source to Scale Retail Applications at Edge Locations

IBM   **intel**   **SCALE** COMPUTING

CHALLENGE

Delivering AI at the Edge can be challenging for many Retail use cases to scale across heterogeneous edge nodes. For example:

- Actionable insights are not available at the point of interaction in real-time
- Low confidence in data makes it not relevant or available for real-time actionable insights
- Cannot deliver insight as soon as data is exposed to the observation layer
- Bringing data science capabilities into a continuous, real-time loop for sense and respond intelligence
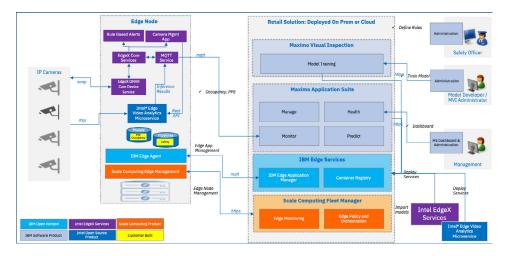
Additional challenges with operationalizing AI @ Edge deployments include:

- Scale: large number of deployments possibly with intermittent connectivity
- Heterogeneity: different and dynamic environments where one model does not fit all
- Data Gravity: vast amounts of raw data that may be in different formats, are noisy, sensitive and regulated.
- Resource Constraints: heterogeneous environments that are constrained in computational and energy resources.

SOLUTION

Leveraging open source projects (including LF Edge's **EdgeX Foundry** and its incubating **Open Retail Reference Architecture** (ORRA) project, Open Horizon, and Secure Device Onboard (SDO), to build commercial solutions that can be applied across multiple industries to address how to rapidly scale actionable insights at the point of interaction — i.e. **delivering AI at the Edge.**

By combining open source technologies from **Intel** based on **EdgeX Services**, and from **IBM** based on Open Horizon, the solution focuses on delivering AI at the Edge showcasing how to speed the deployment and operations delivering fast time-to- value. The initiative shows how customers can use the solution to decrease operational costs through secure, autonomous and declarative management across geographically distributed locations at scale.

The set of capabilities highlighted will be to remotely manage data, applications and AI models independently and flexibly to deliver actionable insights at the point of interaction. The below diagram shows how open technologies can support vendor-agnostic DevSecNetOps tooling and infrastructures, including how to run at the Edge on both Intel and purpose-built **Scale Computing** servers.

Using open source projects delivered an open source- based AI @ Edge Platform to securely connect to, and ingest data from, heterogeneous edge devices, including:

- Robots, cameras, RFID, IoT, sensors, etc.
- Plug & play, tested edge device connectors to work on the platform

Enabled accelerated software development:

- Deliver AI apps to the edge quickly & efficiently with templates (e.g. OpenVINO™ toolkit) without handcrafting each node, camera, IoT/ Sensor, AI
- Leverage existing cloud-native skills (7.1M developers) — No re-skilling needed

Scaled solution with policy-based automation:

- Manage updates to AI models, pipelines & containers with individual lifecycles
- Scalable up to 40K edge nodes for each management hub

Join the open source communities and leverage the underlying open source capabilities used in this project to deliver AI @ Edge use cases in Retail and other industries:

- **Edge X Foundry:** including **EdgeX Core Services**, **Edgex Onvif device service** and **Edge Video Analytics Microservice**.
- **Open Horizon** and **Secure Device Onboard**
- **Open Retail Reference Architecture**

More about the organizations that are involved

IBM: IBM is a founding member of LF Edge working with all members towards an open edge framework. Specific collaborations include active leadership, contribution of seed code for Open Horizon, code and leadership contribution to both EdgeX Foundry and SDO. Additionally, IBM collaborates with LF Edge on the Open Retail Reference Architecture (ORRA), currently incubating within EdgeX Foundry.

Intel: Intel's Health, Education and Consumer Industries group focuses on improving the health and well-being of all life on the planet. They help foster an open ecosystem to help enable partners and end customers to solve tough industry challenges and deliver breakthrough innovations. Intel believes an open ecosystem with support for open source, open software, open standards, open policy and open competition creates a horizontal playing field where innovation thrives.

Scale Computing: Scale Computing Platform brings autonomous, on-premises edge computing with high availability and disaster recovery to remote locations at an affordable entry level cost. All edge models can be deployed quickly, managed locally or remotely, and can self-heal almost instantly. Enjoy affordable edge computing infrastructure that is reliable, easy to deploy, and easy to use

EDGE X FOUNDRY™

OPEN HORIZON

SECURE DEVICE ONBOARD

LF EDGE   BUILDING AN OPEN SOURCE FRAMEWORK FOR THE EDGE