# Home Edge Platform Architecture

Home Edge Project, the seed codes will be contributed by Samsung Electronics, concentrates on driving and enabling a robust, reliable, and intelligent home edge computing open source framework, platform and ecosystem running on a variety of devices at daily home lives. To accelerate the deployment of the edge computing services ecosystem successfully, the Home Edge Project will provide users with an interoperable, flexible, and scalable edge computing services platform with a set of APIs that can also run with libraries and runtimes. The platform architecture of the Project consists of its Modules to provide the Project mission as follows.
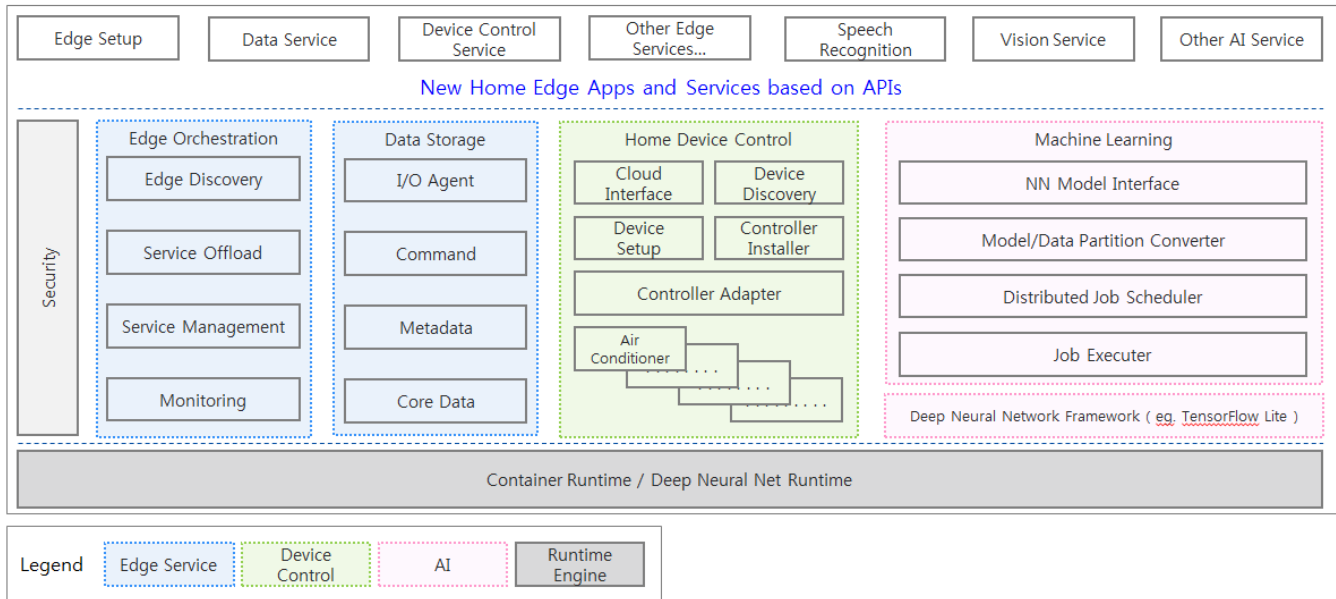
Edge Orchestration Module

- Edge Discovery : Finds the Home Edge devices in a user's home network.
- Service Offloading : Re-deploys services to the other Home Edge device for load balancing of device and/or service.
- Edge Setup : Configures the network information and user's profile on the Home Edge device.
- Service Management : Manages lifecycle and replicas of services.
- Monitoring : Checks and notifies the status of the Home Edge devices and their connected home devices and services in a user's home network.

Data Storage Module

- Core Data : Provides a persistent storage on the Home Edge device for those collected data from its connected home devices (consumer electronics, sensors, and things), and services.
- Metadata : Has knowledge about the identification / profile / data of the connected home devices (consumer electronics, sensors, and things), and services.
- I/O Agent : Provides an API for accessing the data storage.
- Command : Provides a method for getting specific data from the data storage of the Home Edge device by rule-based approach.

Home Device Control Module

- Cloud Interface : Provides the interface between cloud services and each home devices in a user's home network.
- Device Discovery : Finds the connected home devices from the Home Edge device, when the connected home device is found for the first time, their client service will be installed by Controller Installer.
- Device Setup : Sets the required network information of the connected home device for making it join a user's home network.
- Controller Installer : Installs a client service of the discovered connected home device.
- Controller Adapter : Provides unified APIs for the control of the connected home devices.
- Home Device Client : Controls the connected home devices (e.g. user's refrigerator, washing machine, light bulb, door-lock, HVAC, and temperature sensor).

Machine Learning Module

- Neural Network Model Interface : Provides APIs for inference and recognition using (distributed) neural network processing.
- Model Partition Converter : Divides model for distributed neural network processing.
- Distributed Job Scheduler : Schedules and allocates distributed job.
- Job Executer : Executes distributed job on the Home Edge device using Deep Neural Network Framework.

Security Module

- Security Module provides security features that the Home Edge devices and service should have to provide, such as secure on-boarding, Certificate, AAA, encryption/decryption of the message protocols, and so on.

Deep Neural Network Framework

- Deep Neural Network Framework provides dataflow programming framework for machine learning such as TensorFlow Lite.