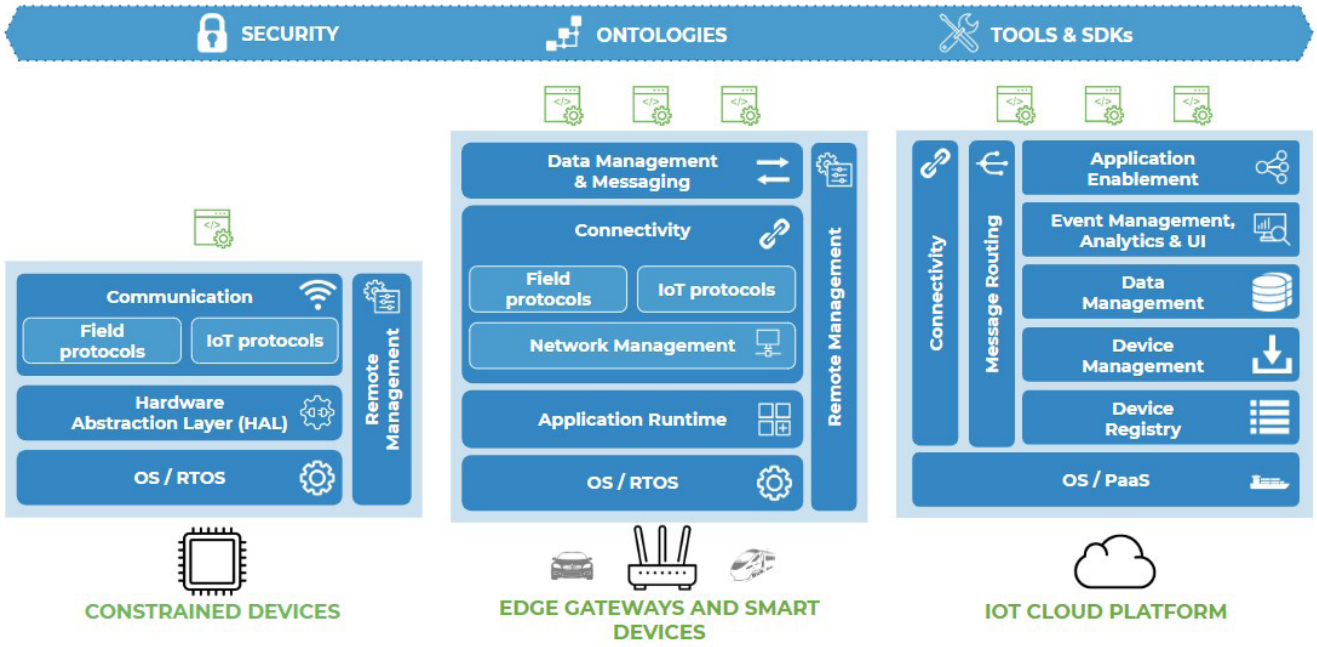
Open Source Technology for IoT

iot eclipse.org

The Eclipse IoT community is very active in providing the technology that can be used in each stack of an IoT solution. Eclipse IoT has grown to over 35 different open source projects that address the different features of IoT stacks. The Eclipse IoT community has more than 40 member companies and 350 contributors who are building IoT solutions based on Eclipse IoT code.

The 3 IoT Software Stacks



A typical IoT solution is characterized by many **devices** (i.e. things) that may use some form of **edge gateway** to communicate through a network to an enterprise back-end server that is running an **IoT platform** that helps integrate the IoT information into the existing enterprise.

The roles of the devices, gateways, and cloud platform are well defined, and each of them provides specific features and functionality required by any robust IoT solution.

OPEN SOURCE STACK FOR CONSTRAINED DEVICES

Eclipse Wakaama provides an implementation of the OMA LWM2M **Device Management** standard.

Open source projects such as **Eclipse Paho** provide implementation of IoT **communication protocols** such as MQTT.

paho

OPEN SOURCE STACK FOR EDGE GATEWAYS

Eclipse Kura provides a general purpose middleware and an application container for IoT gateway services.

Eclipse ioFog makes it possible to deploy and run microservices on compute-capable edge devices in a secure fashion in the context of a distributed Edge Compute Network (ECN).

OPEN SOURCE STACK FOR IOT CLOUD PLATFORMS

Eclipse Kapua is a modular platform providing the services required to manage IoT gateways and smart edge devices.

Eclipse OM2M is an horizontal IoT service platform specific for the telecommunication industry, based on the oneM2M specification.

CONNECTIVITY & PROTOCOL SUPPORT

Eclipse Hono provides a uniform API for interacting with devices using arbitrary protocols and an extensible framework to add other protocols.

Eclipse Mosquitto is an implementation of an MQTT broker.

DEVICE MANAGEMENT & DEVICE REGISTRY

Eclipse Leshan provides an implementation of the OMA LWM2M device management protocol.

Eclipse hawkBit provides management tools to roll out software updates to devices and gateways.

EVENT MANAGEMENT & APPLICATION ENABLEMENT

Eclipse Hono helps to expose consistent APIs for consuming telemetry data or sending commands to devices, so as to rationalize IoT application development.

OPEN SOURCE FOR CROSS-STACK FUNCTIONALITY

SECURITY

Eclipse tinydtls provides an implementation of the DTLS security protocol providing transport layer security between the device and server.

Eclipse Keti provides an access control service that allows each stack in an IoT solution to protect their resources using a RESTful interface.

ONTOLOGIES

Eclipse Unide provides a protocol for Production Performance Management (PPM) in the manufacturing industry. It establishes an ontology for sharing machine performance information.

Eclipse Whiskers implements the OGC SensorThings API that provides a standard way to share location based information for devices.

DEVELOPMENT TOOLS AND SDKS

Eclipse Vorto provides a set of tools and repository for creating device information models.

Eclipse JDT and **Eclipse CDT** allow for integrated development of IoT solutions.

Eclipse Che provides a browser-based IDE that can be used for building IoT solutions.

Ecosystem **Partners**