Eclipse IoT and Eclipse Edge Native: Making Sense of the Puzzle

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Internet of Things
Internet of Things
Internet of Things

A physical object which can:

● Collect and send information
● Receive and act on information
Internet of Things
Internet of Things
Internet of Things

- Connectivity is a given, but stability and reliability are not
- Use of the public internet is optional
Internet of Things

Defined by constraints

- Power
- Bandwidth
- Compute
- Environmental (temperature, etc)
Internet of Things

- **Abstract Hardware**
  - MRAA & UPM (on Zephyr RTOS)

- **Manage & Update**
  - Leshan
  - hawkBit & Hara
  - Kapua
  - Wakaama

- **Develop**
  - Embedded CDT (C/C++ Development Tools)
Internet of Things

Cloud
Internet of Things

- On-demand resources
  - Storage, compute, networking...
- No direct active management by devops
- Anywhere and everywhere
Internet of Things

- Digital Twins
  - Ditto
  - Vorto
- Connectivity (brokers & servers)
  - Californium (CoAP)
  - Mosquitto (MQTT)
- Message Routing
  - Hono
- Analytics
  - Streamsheets
Internet of Things
Internet of Things

Protocols

- CoAP: Californium (client)
- DDS: Cyclone DDS
- MQTT: Paho
- OPC UA: Milo
- PPMP: Unide
- Zenoh
Interoperability for MQTT-based Industrial IoT solutions

- Standard Payloads
- Standard Topic Structures
- Session Management
Sparkplug Working Group

> A working group to steward the Eclipse Sparkplug specification and its implementations, such as Eclipse Tahu

> Launched on February 3, 2020

> More information: sparkplug.eclipse.org
Internet of Things
Four horsemen of Cloudapocalypse

Latency

Bandwidth

Sampling rate

Cost

Things

Cloud
Internet of Things
Internet of Things

Things \hspace{2cm} \rightarrow \hspace{2cm} \text{Edge} \hspace{2cm} \rightarrow \hspace{2cm} \text{Cloud}
Delivering Open Source Edge Platforms. Now.

- Code first
- Simplify and streamline Edge mass deployments
- Edge Native DevOps
Innovative members
Production quality code
Internet of Things

Things <-> Edge <-> Cloud
Internet of Things

**4diac**
Infrastructure for distributed industrial process measurement and control systems

**Keyple**
Open Source API for contactless ticketing

**Kuksa**
Connected vehicle platform

**VOLTTRON**
Distributed control and sensing software platform for energy management

**Vertical applications**

**Things**  
**Edge**  
**Cloud**
IoT Functional Concerns
Where Eclipse Projects Fit

CONSTRAINED DEVICES
- Hardware Abstraction Layer (HAL)
  - LoRa, NB-IoT, Zigbee...
- OS / RTOS
  - FreeRTOS, Zephyr...

EDGE NODES / GATEWAYS
- Application Runtime
  - Java, Jakarta EE, Node.js...
- Network Management
  - LoRa, NB-IoT, Zigbee...
- IoT protocols
- Connectivity
- Data Management & Messaging
- Remote Management

IOT CLOUD PLATFORM
- Application Enablement
- Analytics
- Data Management
- Device Management
- Device Registry

TOOLS
- Models
- Security

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Eclipse IoT Community

3.9M
lines of code

43
projects

350+
contributors

40+
member organizations
IoT Working Group Member Organizations

Strategic members

- BOSCH
  Invented for life
- EUROTECH
- Red Hat

- ADLINK
  Edge Computing
- aloxy
- AZUL SYSTEMS
- CA Technologies
- Calypso Networks Association
- Canonical
- List Managed
- cedalo
- Cirrus Link
- Compex
- CONTACT Software
- DB
- EclipseSource
- edgeworx
- Engineering KNOWAGE
- F5
- fortiss
- GENERATIVE SOFTWARE
- HIVEMQ
- HUAWEI
- IBM
- IncQuery Labs
- inductive automation
- Intel
- itemis
- kichwa coders
- kynetics
- LAAS-CNRS
- The Linux Foundation
- microeJ
- NOKIA
- PNNL
- Siemens
  Sterwen
  Technology
Call to action

> Learn about our projects by visiting iot.eclipse.org/projects

> Try our technology

> Subscribe to the Eclipse IoT newsletter

> Follow and engage with us on social media: @EclipseIoT @EdgeNativeWG

> Join our Virtual IoT Meetup
Join Us!

Become an Eclipse Foundation Member

Join the IoT Working Group as a Strategic Member

Contribute to strategic open source IoT projects
Thank you

Questions?

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iot.eclipse.org
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