

Eclipse IoT Working Group

Charter

Introduction to IoT

Many industry domains such as smart metering, energy management, inventory control, fleet management, healthcare, and security have an inherent need for technology, products and solutions that interface physical world events from sensors, actuators and other types of devices, with Enterprise and Web applications. IoT technology enables these domains, supporting not only the devices and device networks, but also integration with a wide range of enterprise middleware and Web programming models.

An IoT solution is generally composed of:

- Physical assets and devices (sensors, actuators, controllers, LCD display, etc.)
- IoT Gateway to manage assets and server communication. These include communication modules with wireless connectivity (GPRS, 3G, WiFi, Wimax, etc.)
- Monitoring or other domain-specific server infrastructure, with which gateways, communication modules and assets in the field communicate.

Usually, the IoT server infrastructure has to be interfaced with other information systems. Examples are telecom operators (e.g. SIM card subscription management or billing), and enterprise systems (e.g. cargo tracking and vehicle maintenance). An IoT server also needs to expose interfaces allowing third-party applications to access collected data, accept and process control functions, and to perform management and provisioning operations on modules and assets in the field.

Concerns Addressed by IoT IWG

The objective of the IoT Working group is to encourage, develop, and promote open source solutions that can be used to overcome market inhibitors found in most IoT ecosystems, such as:

- Fragmented market: wide range of embedded platforms, programming models, connection types, communication protocols.
- No widely accepted IoT architectural guidelines.
- Limited choices in accepted open, standard communication protocols to deal with IoT requirements and constraints such as; power, CPU, cost, connection availability, and bandwidth.
- Unnecessarily tight coupling between applications, systems and communication interfaces.
- Lack of Open Source IoT development solutions (development environment, development boards)
- Lack of integration with open source Enterprise and Web development tools and environments.

- Monolithic applications and lack of reusable software components (e.g. drivers, communication protocols)
- High barrier of entry to developers who need to integrate IoT, Enterprise, and Web application systems. e.g. hardware and infrastructure costs, no relevant software engineering environment, proprietary interfaces, numerous and complex programming models.
- Inadequate open source support for IoT-oriented middleware, including IoT integration with established middleware solutions.

Purpose and scope of the Working Group

The Eclipse Foundation is a place where people collaborate to deliver exemplary, extensible tools, frameworks and runtime components. The IoT Working Group aims at defining an open development environment and key runtimes for IoT solutions that will enable open solutions. The IoT Industry Working Group will address the following topics:

- Development tools, including simulators/emulators
- Reference architecture and programming model
- Effective decoupling between applications, systems and communication interfaces
- Open and standard communication protocols
- Open and standard APIs (embedded & server).
- Frameworks and services for IoT gateways and IoT Cloud platforms
- Communicate and evangelize the solutions produced by the IoT IWG.

Connections with other standards and industry groups

The IoT Industry Working Group will also work in collaboration with other IoT Industry Groups and Standards organizations in order to avoid fragmentation and duplication of effort, including groups like oneM2M, OASIS, OMA, IETF, IIC and others.

Work areas

The IoT Industry Working Group will work on the following topics:

IoT software components

The IoT Industry Working Group will identify and specify software components needed to efficiently develop IoT solutions (communication services, industrial protocol implementations).

IoT use cases

The IoT working group will identify and maintain common use cases that represent typical IoT environments. The goal is to highlight the capabilities and requirements that need to be standardized to ensure open interoperability, portability, reusability, and ease of integration.

Reference architecture

The IoT Industry Working Group will work on the definition of a set of architectural guidelines ("IoT Blueprints") for IoT solutions, derived from the identified use cases.

IoT tooling

The IoT Industry Working Group will work on the requirements and specifications to support the integration of IoT tooling, with relevant Eclipse tooling that is used by developers of the Enterprise and Web applications who integrate with IoT embedded and server applications.

Open IoT Specifications and Standards

The IoT Industry Working Group will identify, reference and provide implementations of open specifications and standards that support the development and deployment of IoT solutions. The Working Group may also be responsible for defining compatibility test suites for IoT specifications and in some cases creating and maintaining an IoT specification.

APIs

The IoT Industry Working Group will work on the definition of Application Programming Interfaces both on the embedded and on the server-side in order to help increase the modularity, extensibility and effective decoupling of IoT solutions.

IoT software components repository

The IoT Industry Working Group will define the technical requirements for allowing the delivery of IoT-oriented software components (industrial protocol drivers, embedded devices models, code generators, etc.) via the Eclipse Marketplace.

IoT "hacker place" and sandbox

Because IoT development requires actual hardware, and likely prepaid airtime, in order to perform end-to-end experiments, the IoT Working Group may work on the definition of a so-called "hacker place", which will take the form of a website easing the ordering of IoT developer kits (development boards, wireless sensors, 3G modems, etc.). The IoT Working Group will work together with the Eclipse Foundation and hardware providers to propose discounts on developer kits, airtime, etc.

Developing and testing IoT integration with Enterprise and Web applications requires access to middleware, monitoring servers, enterprise servers and various Web application interfaces. The IoT Working Group will work to define and promote the availability of a "sandbox" of accessible server environments for the development, testing and integration of IoT systems with Enterprise, Web, and cloud-based software to developers using Eclipse IoT tools and runtimes.

Communication and Evangelism

The IoT Industry Working Group will work to communicate and evangelize the solutions developed by the IoT IWG. The activities may include joint press releases, joint trade show

participation, publishing white papers and/or preparing other content that communicates the vision and solutions of the IWG.

Steering Committee Roles and Responsibilities

The Eclipse IoT Working Group will have a Steering Committee to help guide the strategy and operation of the working group. The Steering Committee will make decisions based on a simple majority vote of the committee members.

The roles and responsibilities of the Steering Committee include:

- Provide guidance and approval of the annual Eclipse IoT Working Group strategy, positioning and roadmap.
- Approve the technical architecture and composition of any Eclipse IoT solution stack that is based on the overall roadmap.
- Coordination and recruitment of resources to accelerate key project development and integration of the Eclipse IoT roadmap.
- Coordinate Eclipse IoT Working Group membership recruitment
- Approve Eclipse IoT Testbeds.
- Approval of any Eclipse IoT documents, include technical architectures, blueprints, white papers
- Elect a chair of the Eclipse IoT Working Group
- Define the Eclipse IoT working group budget and annual fees.
- Establish sub-committees of the Eclipse IoT Working Group, ex. Architecture and Technical Committee

Participation Guidelines - Membership

Steering committee member

Steering committee members are required to:

- Be a Strategic, Enterprise or Solutions member of the Eclipse Foundation.
- Lead at least one Eclipse IoT project and contribute at least 4 FTE working on Eclipse IoT projects or Eclipse IoT Working Group activities. The activities can include 1) committers working on Eclipse open source projects that support the IoT roadmap, 2) creation of roadmaps and technical documents (including, for example, architectures, blueprints and best practices) supporting the IWG work, 3) evangelism and community development for the IWG and 4) other activities agreed to by the Steering committee.
- Strategic members may also be invited to join the Steering Committee if they demonstrate contributions to at least one Eclipse IoT project, and be approved by a simple majority of the existing Steering Committee members.
- Regularly participate in Working Group meetings and provide timely feedback on Working Group documents.
- Provide executive-level representation at quarterly Steering Committee meetings.

- Provide ongoing marketing and community development support to the Eclipse IoT community.

Member participants

Member participants are required to:

- Be an Eclipse Foundation member at Strategic, Enterprise or Solution level.
- Regularly participate in the Working Group meetings.

Industry Working Group Process

The IoT Industry Working Group will follow the [Eclipse Industry Working Group Process](#).