

IoT Developer Survey - 2020 Version

PAGE 1 About You and Your IoT Solutions

Thank you for participating in the IoT Developer Survey. This survey should take you 5-8 minutes to complete. The survey is organized by the Eclipse IoT Working Group. Your input will help in understanding the IoT community requirements on software and related tools and to develop resources to more effectively help developers working on the Internet of Things. Responses will be collected until **<add date>**

Note: For the purpose of this survey, an IoT solution is defined as a solution that includes devices, sensors or actuators connected via the Internet. It does not include typical mobile applications or traditional desktop solutions.

1. How much experience do you have developing IoT solutions? (1 choice)

- 0-2 years
- 2-5 years
- 5-10 years
- More than 10 years
- No developer experience

2. Which of the following statement(s) best describes your IoT open source project participation? (Select the top three)

- I have no experience with IoT open source projects
- I have experimented with IoT open source technology, but don't use it in IoT solutions
- I report bugs and feature enhancements to open source projects that provide IoT technology
- My organization uses open source technology in our IoT solutions
- I am a committer on an open source project that builds technology for IoT solutions
- I use integrated IoT open source projects in a testbed environment
- Other (please specify what open source projects you use for IoT)

3. Of the following below, which are the top 3 concerns/priorities for developing IoT solutions? (Please only pick 3)

- Certification / conformance
- Complexity
- Connectivity
- Data collection & analytics
- Device management
- Integration with hardware

- Interoperability
- Licensing
- Maintenance
- Performance
- Privacy
- Scalability
- Security
- Standards
- Vendor lock-in
- Other (please specify)

4. What industry or industries best describe(s) the type of IoT solutions you have built or will build? (Select all that apply).

- Agriculture
- Automotive
- Banking / financial / fintech
- Building automation
- Connected / smart cities
- Education
- Energy management
- Environment
- Fitness
- Gaming
- Healthcare
- Home automation
- Industrial automation
- Oil and gas
- Public utilities
- Retail
- Defense
- Public safety
- Transportation
- Utilities
- Vending
- Other (please specify)

PAGE 2 IoT Standards and Technology

For the following questions, please keep the following definitions in mind (also see: [Eclipse IoT Whitepaper — The Three Software Stacks Required for IoT Architectures](#)):

Constrained Device: A constrained device has limited power, memory, and/or processing resources. Examples of constrained devices include micro-controller units (MCUs).

Edge/Gateway: An IoT gateway acts as the aggregation point for a group of sensors and actuators to coordinate the connectivity of these devices to each other and to an external

network. It can be a physical piece of hardware or functionality that is incorporated into a larger “Thing” that is connected to the network.

Cloud: The Cloud represents the software infrastructure and services required to enable an IoT solution. The IoT Cloud will facilitate the interoperability of the IoT solution with existing enterprise applications and other IoT solutions.

5. Which of the following programming languages, if any, do you use to build IoT solutions? Please identify the programming language you use for each category. (Select the top three)

	IoT Constrained Device	IoT Gateway / Edge Node	IoT Cloud
Assembler			
C			
C++			
Go			
Java			
Javascript			
Lua			
Python			
PHP			
Rust			
Ruby			
I do not develop on this tier			
Other			

6. Which operating systems do you use for your IoT devices (Constrained Device and Edge/Gateway)? (Select the top three) [Keep and drop long tail OS's](#)

	Constrained Device	Edge/Gateway
Amazon FreeRTOS		
Contiki / Contiki-NG		

FreeRTOS		
Huawei LiteOS		
Linux (any distro, including Raspbian)		
Mbed OS		
QNX		
RIOT OS		
VxWorks		
Windows		
Zephyr		
No OS / Bare-metal		
Other		

Other (please specify for each category)

**7. If you are using Linux, what distribution do you typically use for your IoT solution?
(Select top three)**

- Automotive Grade Linux
- CentOS
- Debian
- Fedora / Fedora IoT
- OpenWrt or equivalent (e.g. Linino, LEDE, ...)
- Raspbian
- Tizen
- Ubuntu / Ubuntu Core
- uClinux
- Wind River Linux
- Yocto Project
- Don't use Linux
- Other (please specify)

8. What hardware architectures are you using for your IoT constrained device(s)? (select the top three)

- ARM Cortex-M0 / ARM Cortex-M0+
- ARM Cortex-M3 / ARM Cortex-M4
- ARM Cortex-M7
- MIPS
- RISC-V

- RX
- 8-bit MCU (please specify in box below)
- 16-bit MCU (please specify in box below)
- Other 32-bit MCU (please specify in box below: ANDES, ARC, Tensillica, ...)
- Don't use constrained devices
- Other (please specify)

9. What hardware architectures are you using for your IoT gateway(s) or edge node(s)? (Select the top three)

- ARM v6
- ARM v7-A (Cortex-A 32 bits)
- ARM v7-M (Cortex-M)
- ARM v7-R (Cortex-R)
- ARM v8 (Cortex-A 64 bits)
- Intel x86
- Intel x86_64
- MIPS
- RISC-V
- Don't use gateways
- Other (please specify)

10. If your IoT solution leverages Edge Computing, what types of edge computing workloads are you running? (Select the top three)

- Artificial Intelligence
- Control Logic
- Data Analytics (involving 1GB+ of local storage)
- Edge-deployed Cloud workloads
- Data exchange between multiple nodes
- Data exchange between multiple nodes on multiple sites
- Sensor fusion (Data aggregation and filtering)
- Video Processing and Analytics
- Other (please specify)

11. If your IoT solution leverages Edge Computing, what kind of artifact do you deploy and how is the deployment performed? (Select the top three)

- Container images
- Native binary
- OSGi Bundles
- Script files
- Serverless functions (lambdas, etc)

- Virtual machines
- Other (please specify)

12. How do you deploy the artifacts of your IoT and Edge Computing solutions(applications, firmware updates, etc)? (Select all that apply)

- Cloud-managed over the air updates
- Locally-managed over the air updates
- Network cable (connected to a laptop or other local device without a remote network connection)
- Removable Media (USB stick, SD Card, etc.)
- Other (please specify)

PAGE 3 Security, Data and Platforms

13. Which of the following security-related technologies do you use in your IoT solution: (Select the top three)

- Blockchain / distributed ledger
- Communication security (e.g. TLS, DTLS)
- Data encryption
- JSON web token or similar token formats
- OAuth & OpenID
- Over the air update
- Public key infrastructure (PKI)
- Secure boot
- Use of Hardware Security Modules (HSM)
- Use of Trusted Platform Modules (TPM)
- No security technology is used (be honest!)
- Virtualization
- Other (please specify)

14. What type of IoT data/information are you storing in a database or data store?

- a. Time series data
- b. Log data
- c. Device information
- d. Images, including video
- e. Audio
- f. Contextual data, e.g. adding location or geospatial context to device, sensor, etc.
- g. Enterprise data, e.g. related information such as business impact, people involved, etc.
- h. Operational data, e.g. data from connected systems, such as Machine, Grid, etc.

- i. Other (please specify)

**15. Which of the following database technologies do you use in your IoT solutions?
(Select the top three)**

- Apache Cassandra
- Apache HDFS
- Apache HBase
- Apache Kudu
- Couchbase
- DynamoDB
- InfluxDB
- MemSQL
- MongoDB
- MySQL / MariaDB
- openTSDB
- PostgreSQL
- Riak
- Prometheus
- Commercial database product (please specify)
- Open Source database (please specify)

16. Do you use, or plan to use, any of the following platforms for implementing your IoT solution? (Select the top three)

- Amazon AWS
- Cloud Foundry (on-premise)
- Google Cloud Platform
- IBM Cloud
- Kubernetes (on-premise)
- Microsoft Azure
- OpenStack (on-premise)
- Other Private/On-premise cloud
- Red Hat OpenShift
- None
- Other (please specify)

17. Which of the following IoT Middleware do you use? (Select the top three)

- AWS IoT
- Bosch IoT Suite
- Cumulocity
- Google Cloud IoT Platform

- IBM Watson IoT Platform
- Microsoft Azure IoT
- Salesforce Cloud IoT Platform
- ThingWorx
- Other (please specify)

PAGE 4 Connectivity and Messaging

18. What communication protocol do you use for your IoT solutions? (Select the top three)

- AMQP 0.9
- AMQP 1.0
- CoAP
- DDS
- HTTP / HTTPS
- HTTP/2 (with or without TLS)
- In-house / proprietary
- MQTT
- MQTT + Sparkplug
- Proprietary vendor protocol (please specify below)
- REST
- TCP/IP
- UPnP
- WebSockets
- XMPP
- Other (please specify)

19. What connectivity protocol(s) do you use for your IoT solution? (Select the top three)

- 6LoWPAN
- Bluetooth / Bluetooth Smart
- Cellular (LTE, 4G, 5G, etc.)
- Chirp
- DASH7 Alliance Protocol
- LTE / LTE-M
- Ethernet
- LoRa
- NB-IOT
- Satellite
- Serial RS-232/RS-485
- Sigfox
- Wi-Fi
- Z-Wave

- Zigbee
- Other (please specify)

PAGE 5 Tools and organizations

20. Which text editor(s) or IDE(s) do you use when building IoT solutions? (Select the top three)

- Atom
- Android Studio
- Arduino IDE
- Eclipse Che
- Eclipse Desktop IDE (e.g. Eclipse JDT, Eclipse CDT, ...)
- Eclipse Theia
- Emacs
- Mbed Studio
- Notepad++
- IntelliJ IDEA
- Sublime
- Visual Studio Code
- Vim
- Other (please specify)

21. How would you rank your organization's perceived importance of the following IoT Consortia to your IoT strategy?

Important / Neutral / Not Important / Don't Know / Never Heard of Them

- Apache Software Foundation
- DASH7 Alliance
- Eclipse IoT / Eclipse Foundation
- IEEE
- IETF
- Industrial Internet Consortium (IIC)
- Linux Foundation (inc. CNCF, LF Edge, ...)
- LoRa Alliance
- OASIS
- oneM2M
- Open Connectivity Foundation (OCF)
- Open Mobile Alliance (OMA)
- Open Robotics
- Thread Group
- W3C
- Other (please specify)

PAGE 6 About Yourself

Only a few questions to go. Please tell us a bit about yourself.

22. Where do you live?

- Europe
- Middle East, Africa
- Asia and Pacific
- North America
- South America

23. What is your job title?

- Developer
- Architect
- Testing
- Development Manager
- Product Manager
- IoT Business Line Manager
- Sales / Business Development
- Executive
- Researcher
- Student
- Independent Consultant
- Currently Unemployed
- Other (please specify)

24. How large is the organization you work for?

- Less than 100
- 100 to 500 employees
- 501 to 1000 employees
- 1,001 to 5,000 employees
- 5,001 to 10,000 employees
- More than 10,000 employees

PAGE 8 Survey Results

25. If you would like to receive a copy of the survey results please enter your contact information. Your contact information will only be used to distribute the results and will not be shared with others.

Email Address: