



2025 Eclipse IoT and Embedded Developer Survey Report



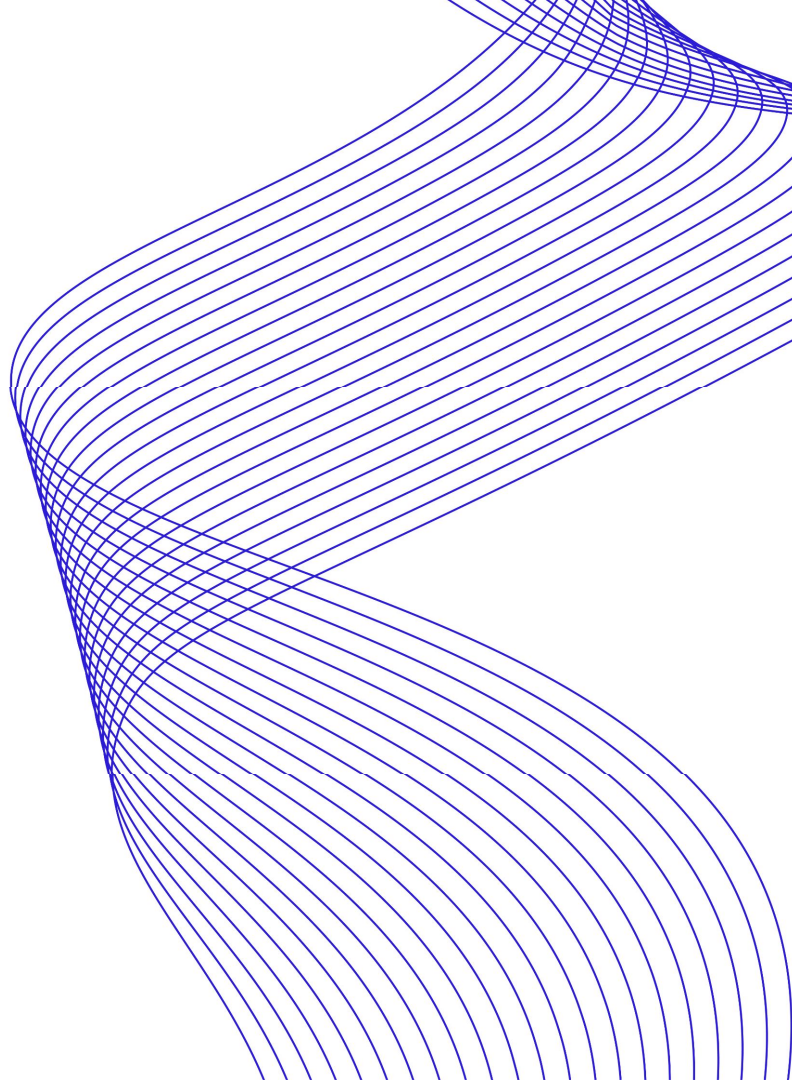
Introduction

Welcome to the **2025 Eclipse IoT & Embedded Developer Survey Report**. We trust this report will provide you with actionable data and insight into an evolving IoT and embedded landscape.

This report aims to share with the embedded, edge, and IoT ecosystem data on industry trends, developer preferences, and other key influences on the development lifecycle. Major focus areas include:

- The shifting demographic trends in the developer and commercial ecosystem
- The preferences and constraints developers face when making application and communication design decisions
- The impact security, safety, and compliance regulations are having on design choices

We thank everyone who took the time to complete the survey and share their perspective.



A community collaboration

The 2025 IoT and Embedded Survey captured information from a diverse set of respondents - providing a valuable glimpse into the professional background, industry representation, and location of individuals actively involved in the development of embedded, IoT, and edge solutions.

The survey highlights the opinions and preferences of a developer landscape heavily driven by hands-on technical roles, with a significant proportion of respondents identifying as direct contributors to An open source codebase.

Participating communities



About the survey respondents

Demographic data at a glance

The largest segment of respondents were Software Developers, representing 21.77% of the total.

R&D Management came in second with 11.37% - indicating that a substantial portion of the audience holds technical, leadership, and strategic roles.

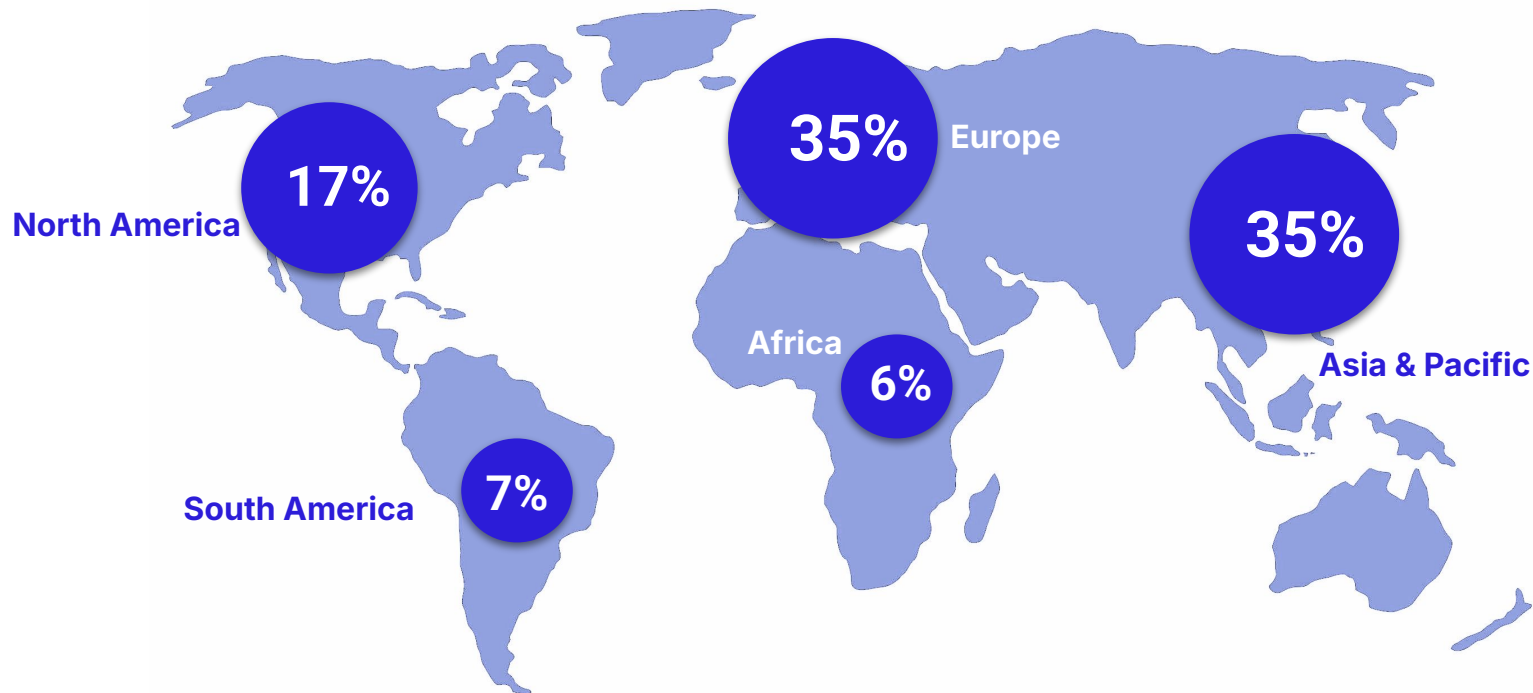
2025 saw increases in the number of developers with 0-2 and 2-5 years of experience, and slightly fewer respondents with 10+ and 5-10 years of experience than 2024.

This highlights the shift mirrored in the larger commercial ecosystem.

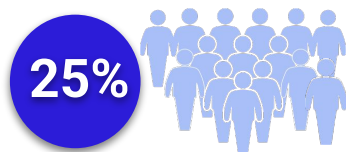
IT/Telecom developers once again lead the way for industry representation. This confirms their role as a **key enabler and market-maker**.

The automotive, industrial and building automation, energy, consumer IoT, and agricultural sectors were also heavily represented.

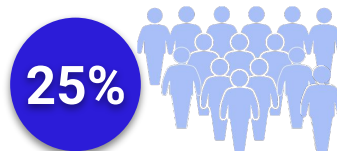
A global developer ecosystem - where are they located?



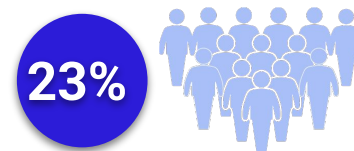
A diverse community of experts - industry focus areas



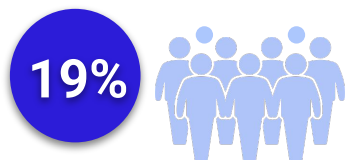
IT/Telcom



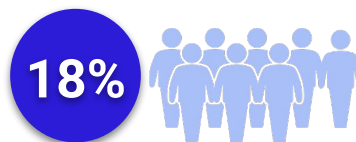
Industrial
automation



Automotive



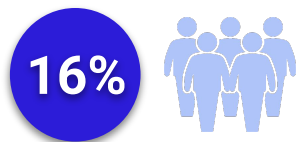
Energy



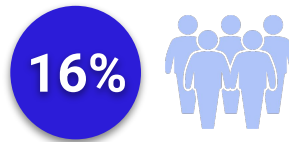
Building
automation



Consumer IoT



Agriculture



Education

What the data said

What is your primary role in the development lifecycle?



21.77%

Software developers



11.37%

R&D management



10.40%

Embedded systems engineer

How many employees work in your organisation?



56.56%

Fewer than 100 employees



15.37%

Organizations with over 10,000 employees

What industry do you work in?



17.98%

IT/Telecom



11.11%

Education



5%

Energy, automotive financial, industrial, and agricultural

How much experience do you have developing embedded, IoT or edge solutions?



30.04%

0-2 years



14.72%

2-5 years



14.31%

5-10 years



26.41 %

10+ years

Developer software and hardware preferences

A closer look at developer preferences

The 2025 Survey heavily focused on the design challenges, preferences of developers, and operating system choices within the software developer community building in the embedded, IoT, and edge domains. The results clearly indicate dominance by incumbent organizations and noticeable growth in the open source ecosystem.

Developers also shares their preferred hardware architectures across different segments of the IoT and embedded space. The survey results highlight the continuing dominance of established platforms, the rise of newer architectures like RISC-V, and shine a spotlight on the specialized needs for AI at the edge.

The data highlights a continued focus on addressing complexity, while traditional and more modern technologies compete for dominance across different hardware constraints.

Developer software preferences at a glance

When asked about their **top 3 development challenges** in embedded, IoT, or edge solutions, respondents clearly prioritized data flexibility, maintenance, and complexity.

The **variety of Linux distributions used in IoT solutions** highlights the diversity in deployment strategies and the maturity of the open source software ecosystem.

The **competition in the constrained device OS ecosystem created an even mix** of general purpose applications, real-time operating systems (RTOS), and bare-metal approaches.

Developer hardware preferences at a glance

The Arm Cortex-M family continues to dominate the market for constrained devices. Also capturing a notable share was the **ESP32 family** - which continues to grow as a popular choice due to their feature-rich solution and connectivity integrations.

The architectural landscape for enterprise and industrial applications was characterized by a few key players. **AMD/Intel x86_64** is the undisputed leader. However, Arm remains critical at the edge. **RISC-V continues to grow** its market share.

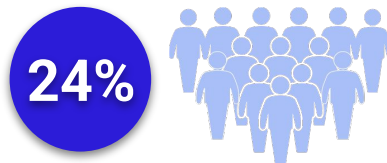
The market for hardware accelerators is clearly optimized for applications requiring parallel processing. **NVIDIA dominates** the market with strong representation of the Jetson and others. **Google's Coral TPU, Intel Movidius and FPGAs also remain popular.**

Most common challenges developers face



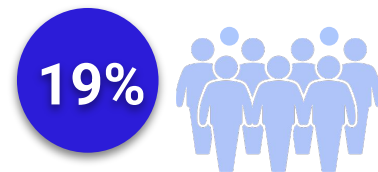
35%

**Data collection, analytics,
and decision-making at
the edge**



24%

**Maintenance and lifecycle
updates (hardware and
software)**



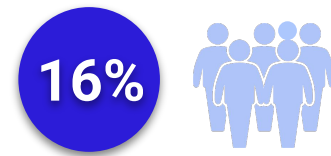
19%

**Deployment complexity
and remote fleet
management**



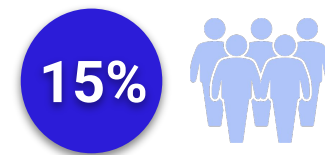
17%

**Cybersecurity threats and
mitigation**



16%

**Time-to-market
pressures**

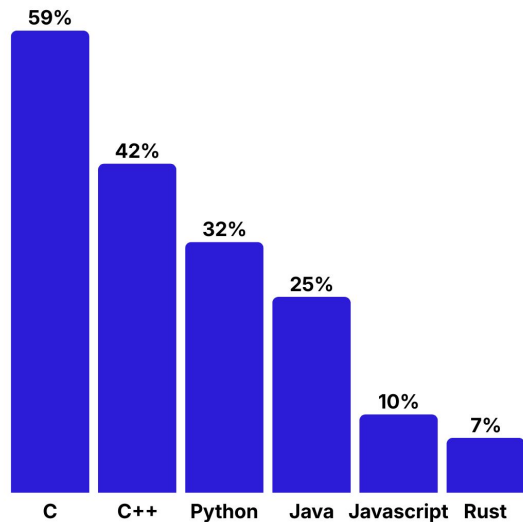


15%

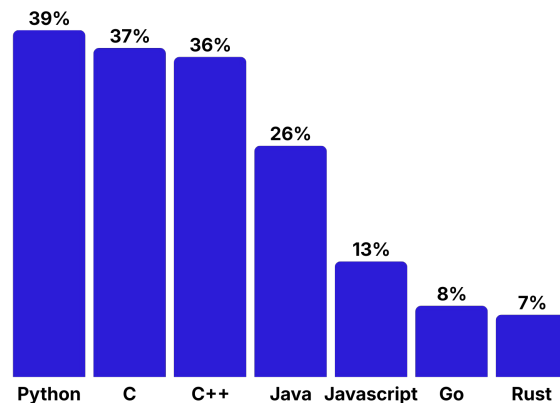
**Regulatory compliance
and safety certifications**

Developer language preferences

Which programming language(s) do you use to **build on constrained devices**?

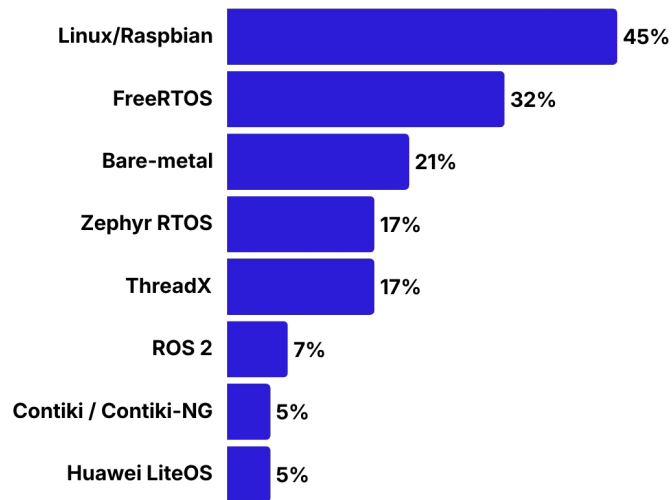


Which programming language(s) do you use for **development on edge nodes**?

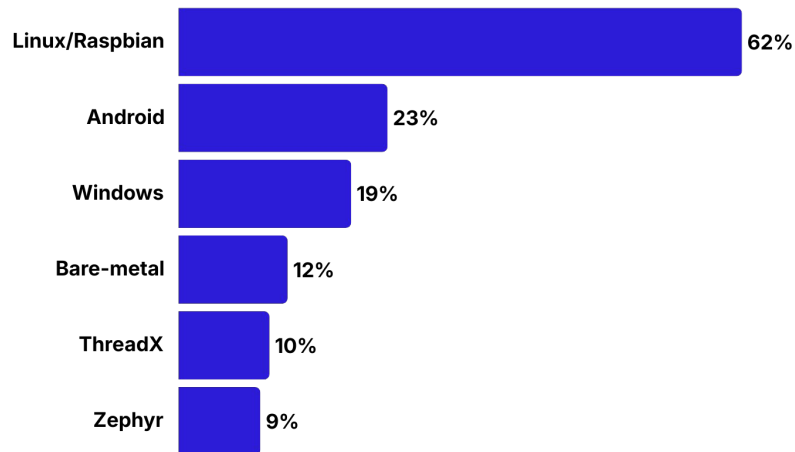


Developer operating system preferences

Which embedded operating system(s) do you use for **constrained devices**?

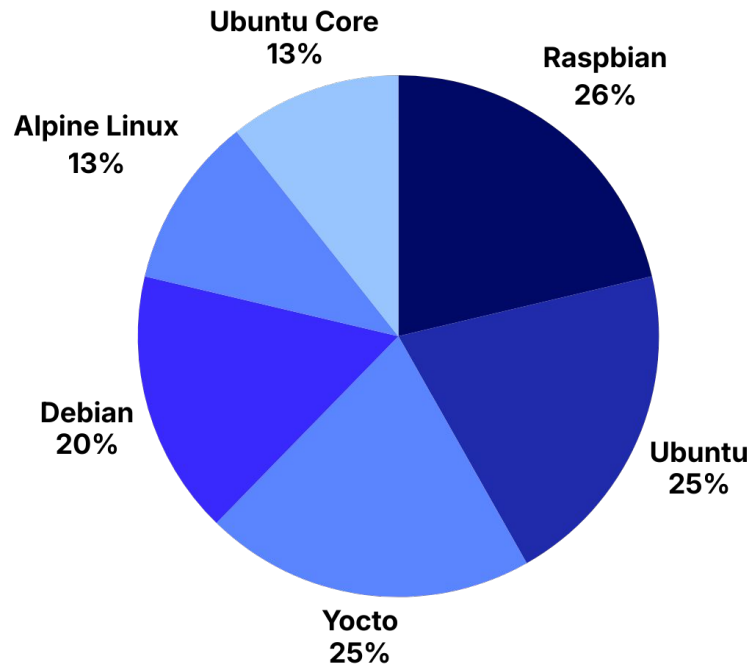


Which operating system(s) do you use for your **IoT gateways & edge nodes**?



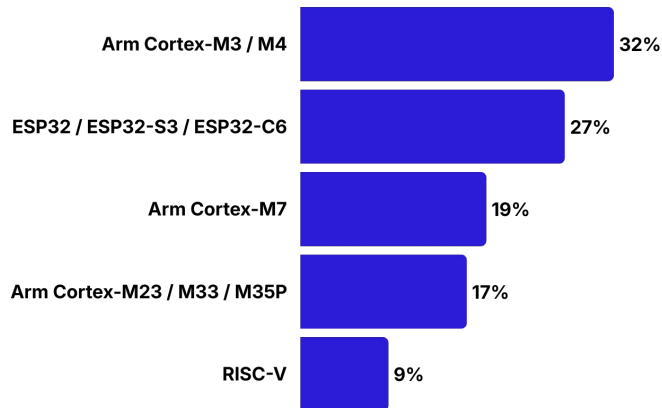
Developer operating system preferences

If you use **Linux in your IoT solutions**, which distribution(s) do you typically deploy?

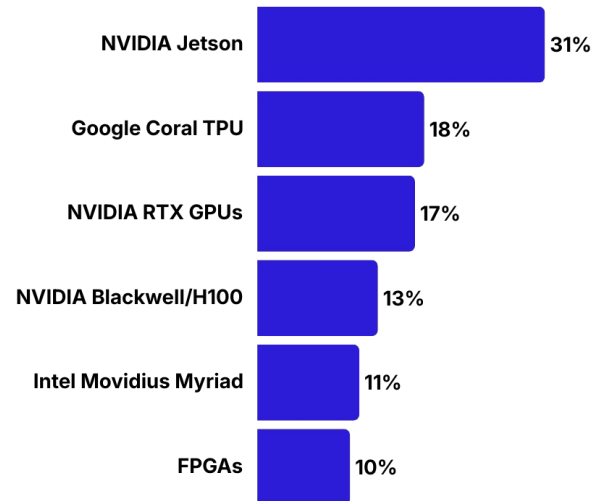


Developer hardware preferences

Which hardware architecture(s) do you use for **constrained devices**?

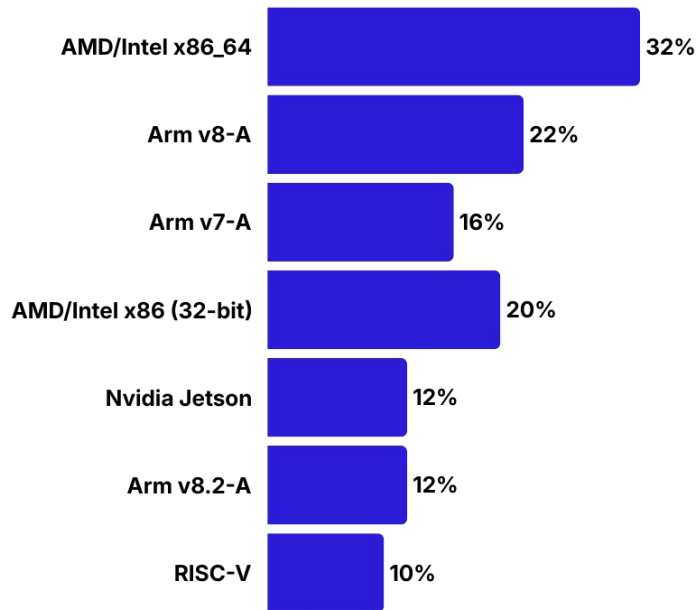


Which hardware architecture(s) do you use for **constrained devices**?



Developer IoT and edge gateway hardware preferences

Which hardware architecture(s) do you use for IoT gateways & edge nodes?



Developer networking and connectivity preferences

Connectivity and networking at a glance

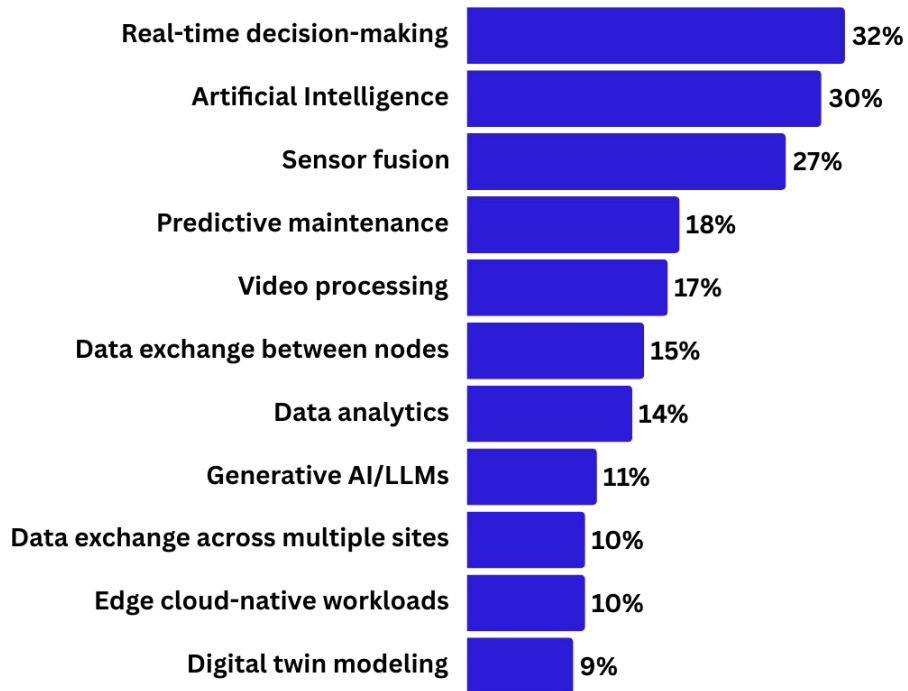
When deploying edge gateways and nodes, the types of workloads run are critical for enabling real-time responsiveness and optimizing power. Our data suggests that the most common functions executed at the edge are focused on latency and autonomous operation.

Securing IoT and edge solutions is paramount, given the distributed nature and potential vulnerabilities of edge deployments. The implemented security technologies focus heavily on update mechanisms, communication integrity, and foundational device trust.

Connectivity protocols define the means by which devices access the network. The survey data shows a mix of short-range, local-area, and wide-area technologies which indicates a diverse and complex set of deployment scenarios for IoT and edge solutions.

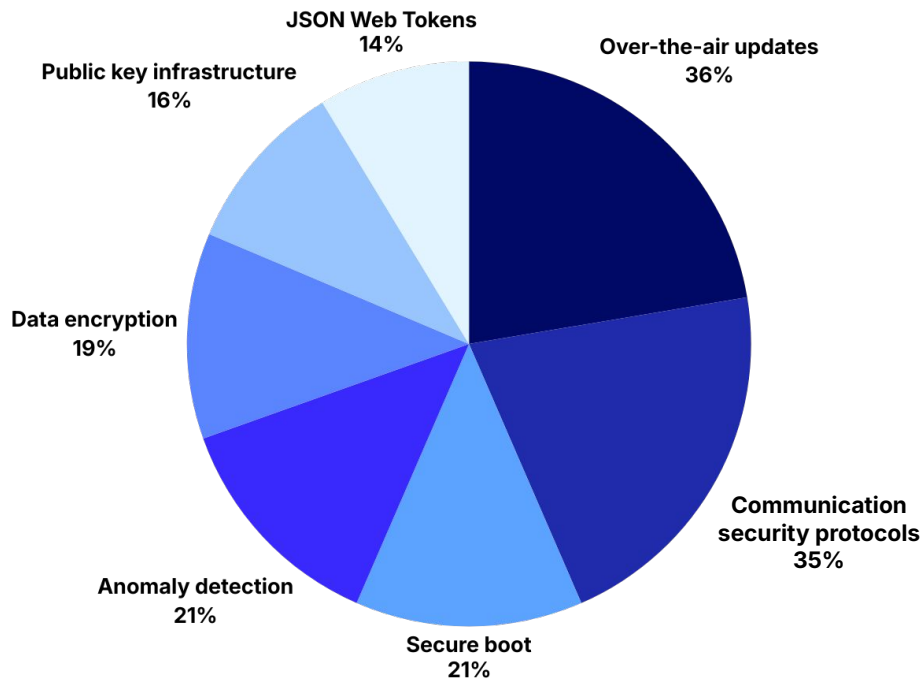
Edge gateway workloads

If your solution leverages **edge gateways and/or edge nodes**, what types of workloads are you running at the edge?



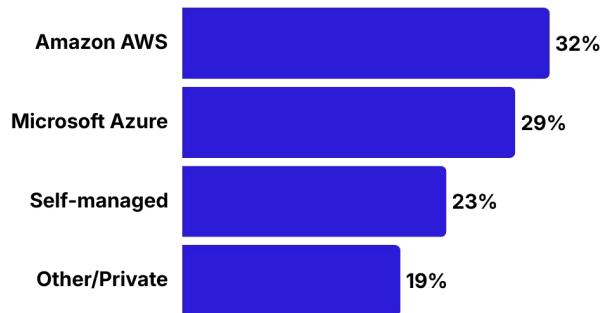
Security implementations at the edge

Which security technologies are implemented in your IoT or edge solutions?



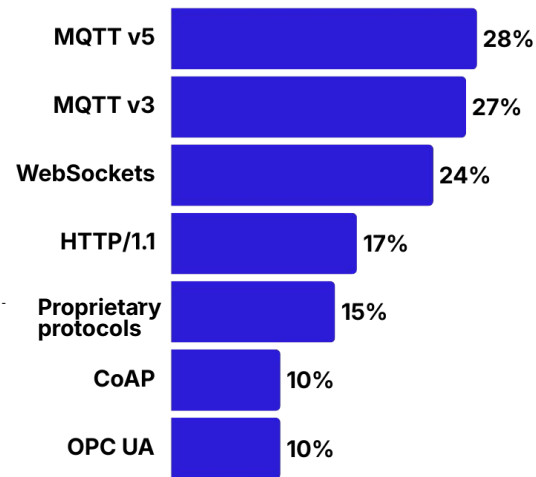
IoT and edge platform stack preferences

Which platforms are part of your **IoT or edge deployment stack**?



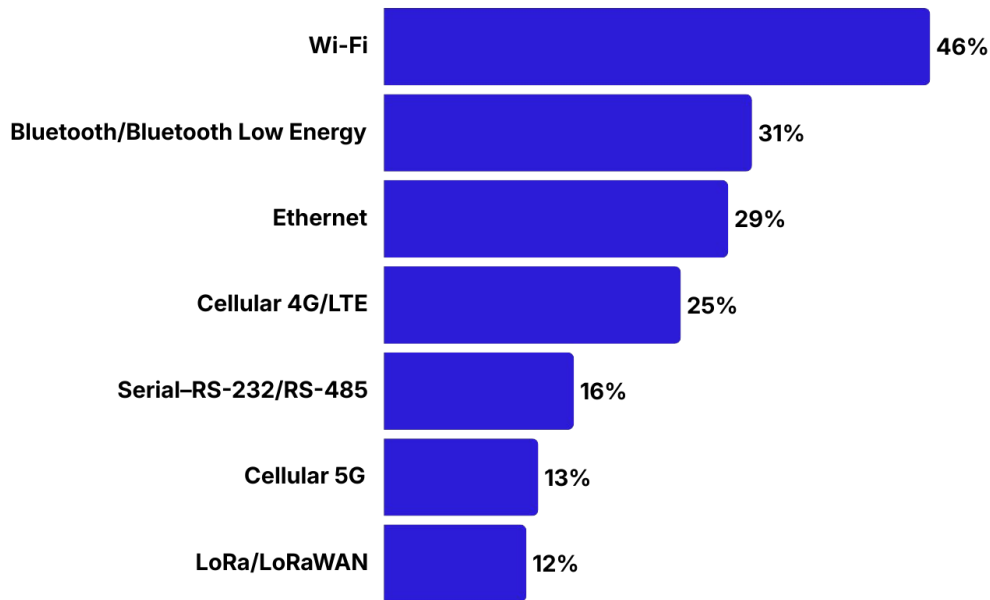
Communication protocols at the edge

What communication protocol(s) do you use in your **IoT/edge deployments**?



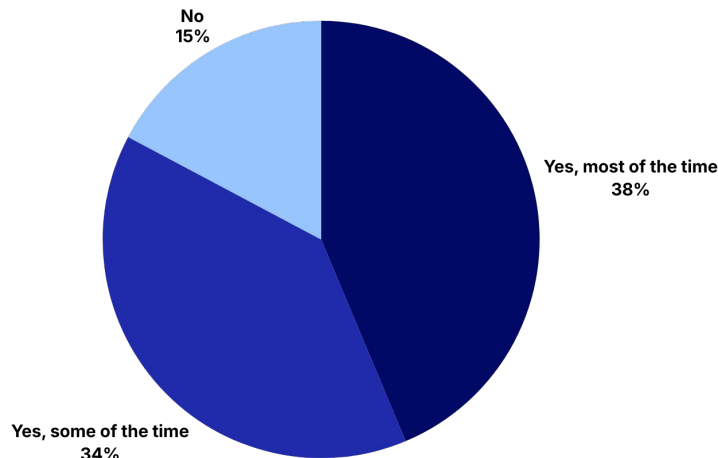
IoT and edge connectivity protocol preferences

Which connectivity protocols do you use in your **IoT/edge** solutions?



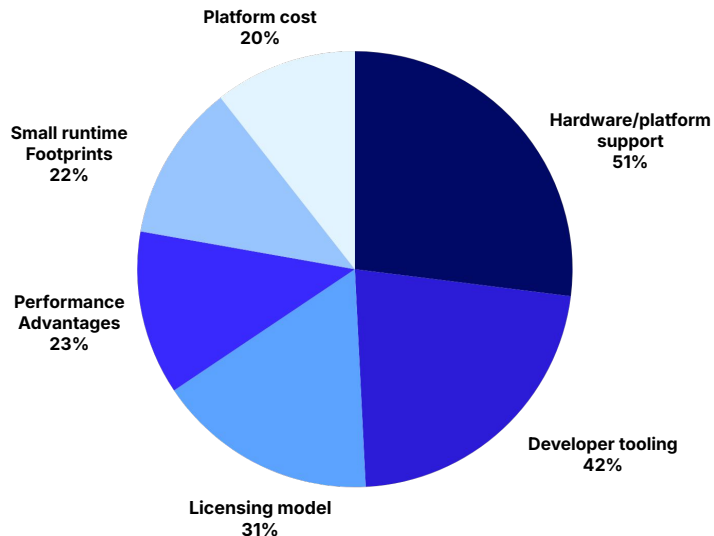
The reality of real-time operating system use

Do the constrained devices in your solution run a real-time operating system (RTOS)?



RTOS advantages drive design choices

If some or most of your constrained devices run a real-time operating system, what factors influenced your choice of a real-time operating system (RTOS)?



Security, safety certifications, and compliance requirements and preferences

Safety, compliance, and security at a glance

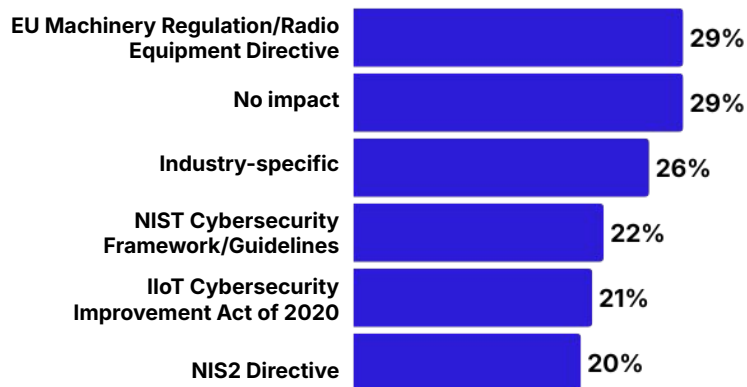
Security certifications serve as crucial trust indicators and play a pivotal role in procurement and adoption decisions. In 2025 the survey data suggests regulatory pressure is increasingly influencing the decision to adopt open source or purchase a proprietary solution.

In many application domains—especially automotive, industrial, and medical sectors—safety standards superseded security concerns in terms of prioritizing engineering resources. However, the relevance of specific safety certifications became more highly stratified.

When developing end-user applications the choice of framework was crucial for efficiency, quality, and maintainability. Our data suggests the two most important factors when choosing an app development framework were strong community and platform support.

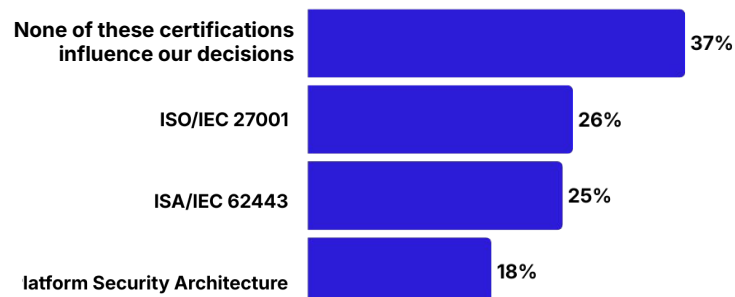
Regulatory compliance at a glance

Regulatory compliance is increasingly shaping product and solution design. Which of the following legal requirements most influence your **cybersecurity decisions for IoT, edge, or dge AI development**?



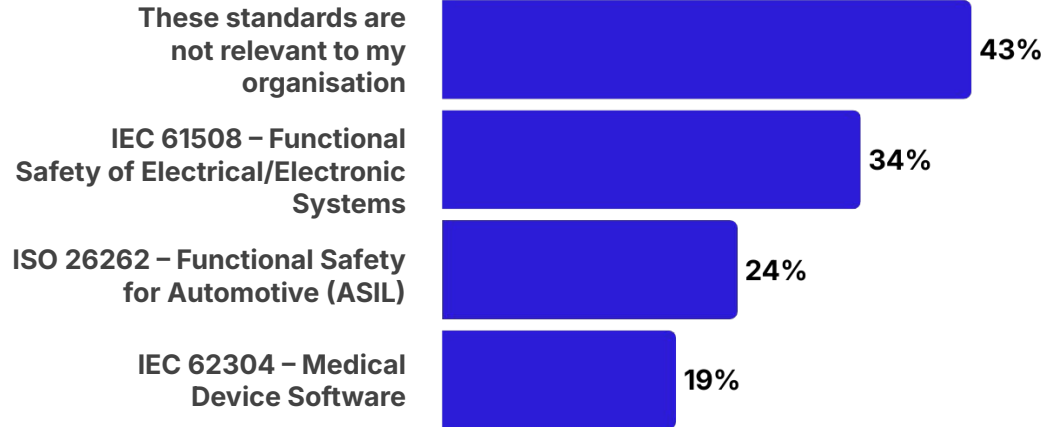
Trust and security preferences

Security certifications can play a key role in assessing the trustworthiness of IoT technologies. Which of the following certifications would positively influence **your decision to adopt or purchase a solution**?



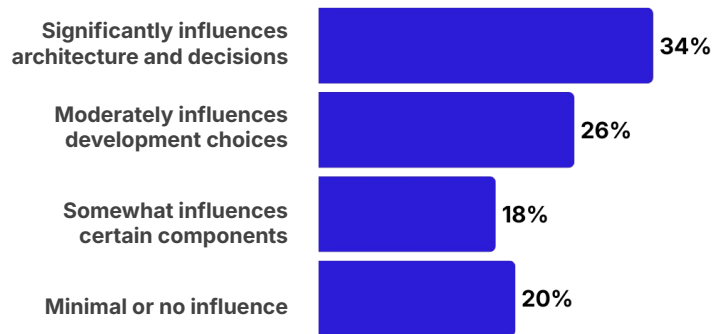
The importance of safety certifications

Which of the following safety certification standards are most relevant to your **products or development efforts**?

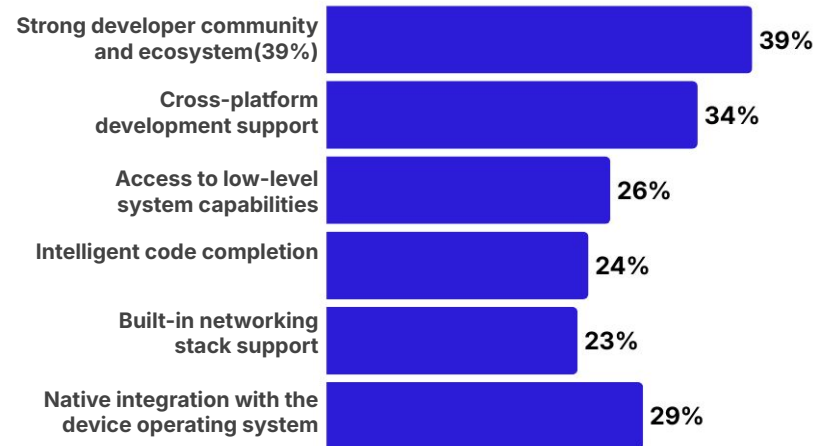


End users and priority setting

To what extent does end use **application design** influence your IoT solution?



Which two factors are most important when choosing an **app development framework** for your end user IoT application?



Recommendations

Recommendations

- **Tailored learning and training resources.**
The ecosystem is changing - more resources in multiple languages and skill levels are essential for the continued success and growth of the community.
- **Reduce complexity without limiting choice.**
Successful organizations will deliver flexible, modular, open source designs to drive developer adoption and reduce overhead. Keep it simple!
- **Invest in the ecosystem.** The software and hardware ecosystems will continue to accelerate timelines due to open source options. Directly participating in sustainability efforts is critical to long term success.





Name
threadx-info@eclipse.org