

IoT DEVELOPER SURVEY

APRIL 2016



SURVEY INTRODUCTION

- The **Eclipse IoT Working Group**, **IEEE IoT** and **AGILE IoT** co-sponsored an online survey to better understand how developers are building IoT solutions.
- The survey was open from February 11 until March 25, 2016. A total of **528 individuals participated** in the survey. Each partner promoted the survey to their communities through social media and web sites.
- A similar survey was conducted in 2015 by the Eclipse IoT Working Group. Details are available at <http://www.slideshare.net/IanSkerrett/iot-developer-survey-2015>



KEY FINDINGS

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46% of respondents are **delivering IoT solutions today**

An additional **29%** have plans to deliver an IoT solution in the next 18 months.



KEY FINDINGS

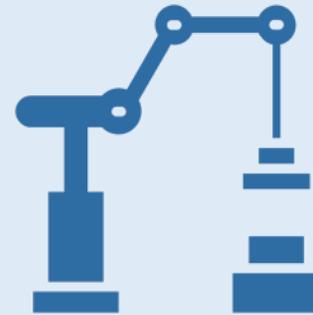
Top 5 IoT Industries



IoT PLATFORMS



**HOME
AUTOMATION**



**INDUSTRIAL
AUTOMATION**



**ENERGY
MANAGEMENT**



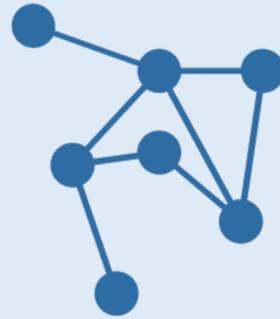
**CONNECTED
CITIES**

KEY FINDINGS

Top 3 concerns



SECURITY



INTEROPERABILITY



CONNECTIVITY

KEY FINDINGS

Top IoT programming languages



C



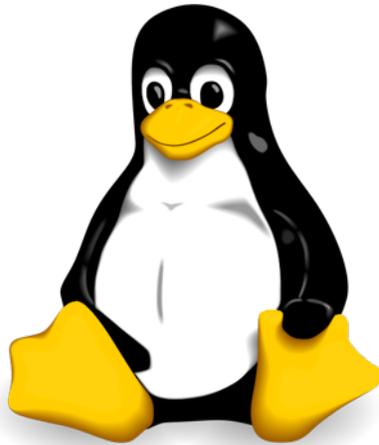
Top IoT messaging protocols



HTTP

KEY FINDINGS

Top IoT Operating System



Linux

Top IoT cloud services



Private cloud

Microsoft Azure

KEY FINDINGS

Open IoT



58%

actively participate in

open source

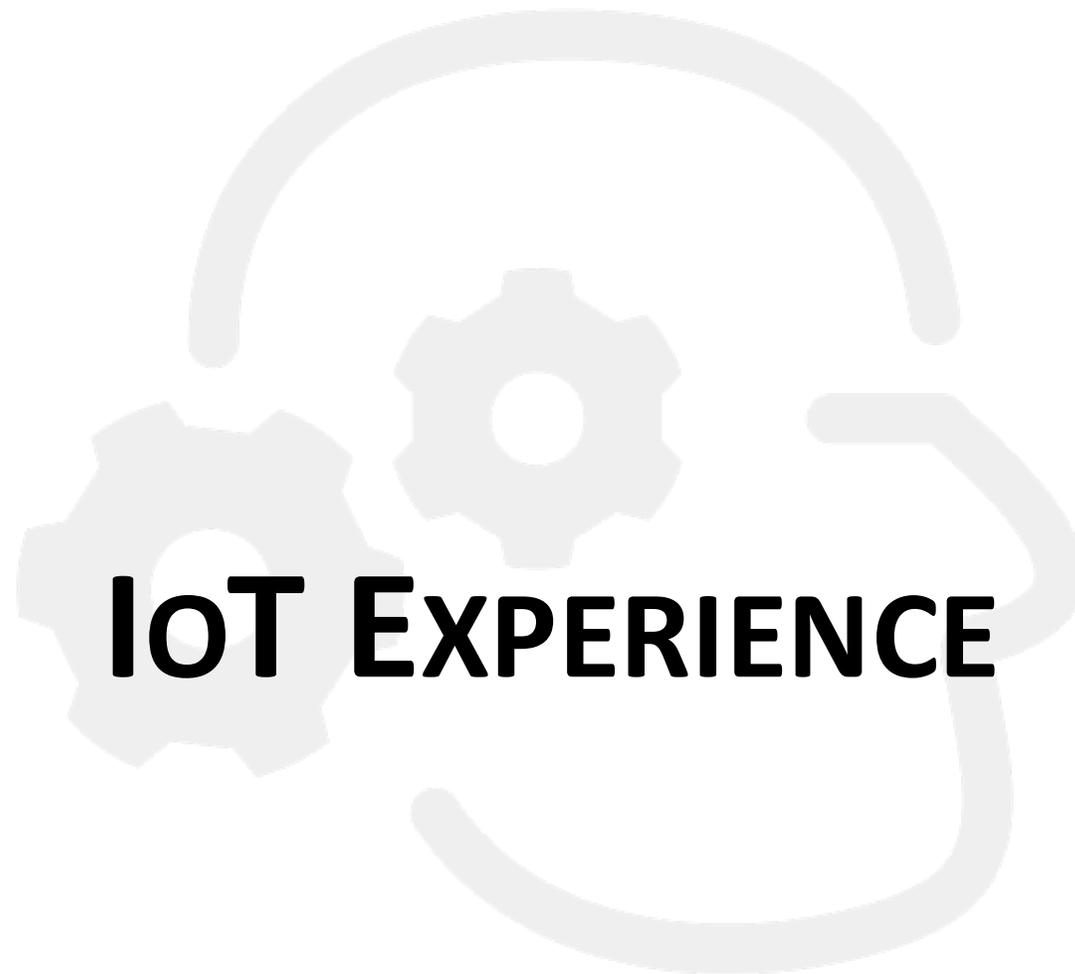
projects for IoT

52%

use

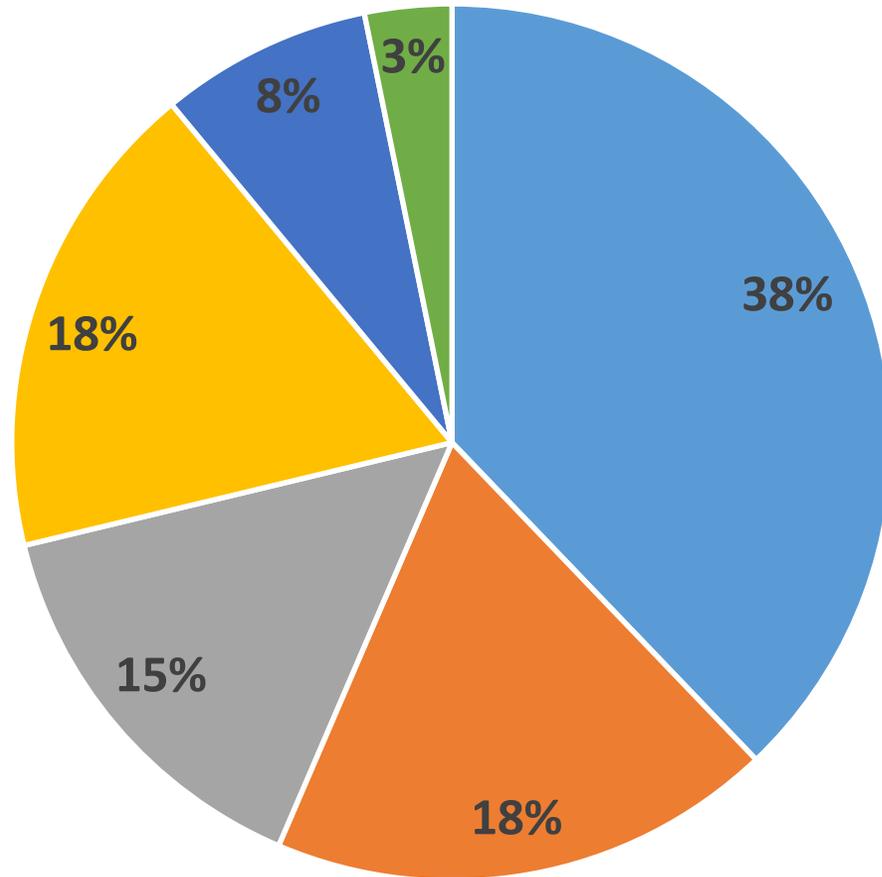
open hardware

for deployment or prototyping



IoT EXPERIENCE

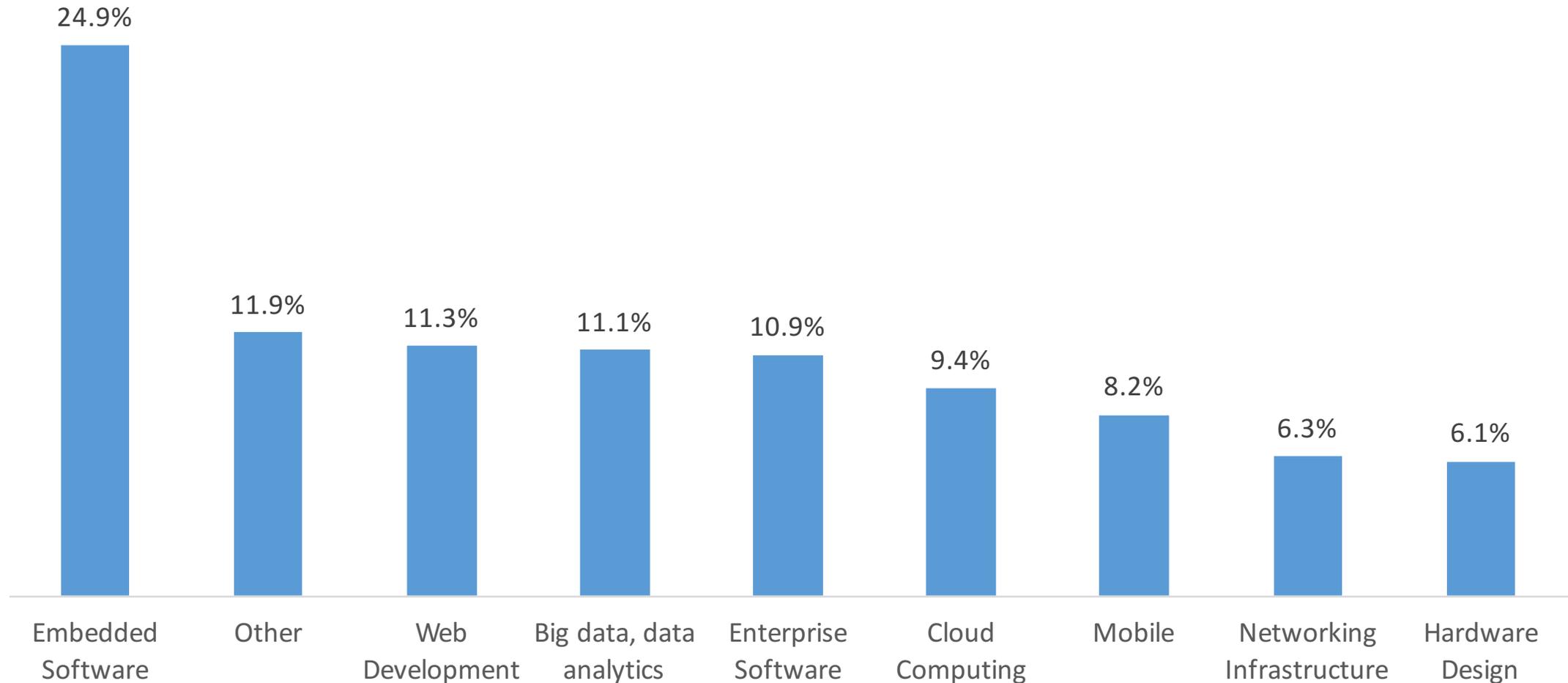
What is your experience with building IoT solutions?



- I develop IoT solutions for my company
- I am researching IoT solutions for my company
- I develop IoT solutions in my spare time
- I am learning about IoT technology in my spare time
- No experience
- Other

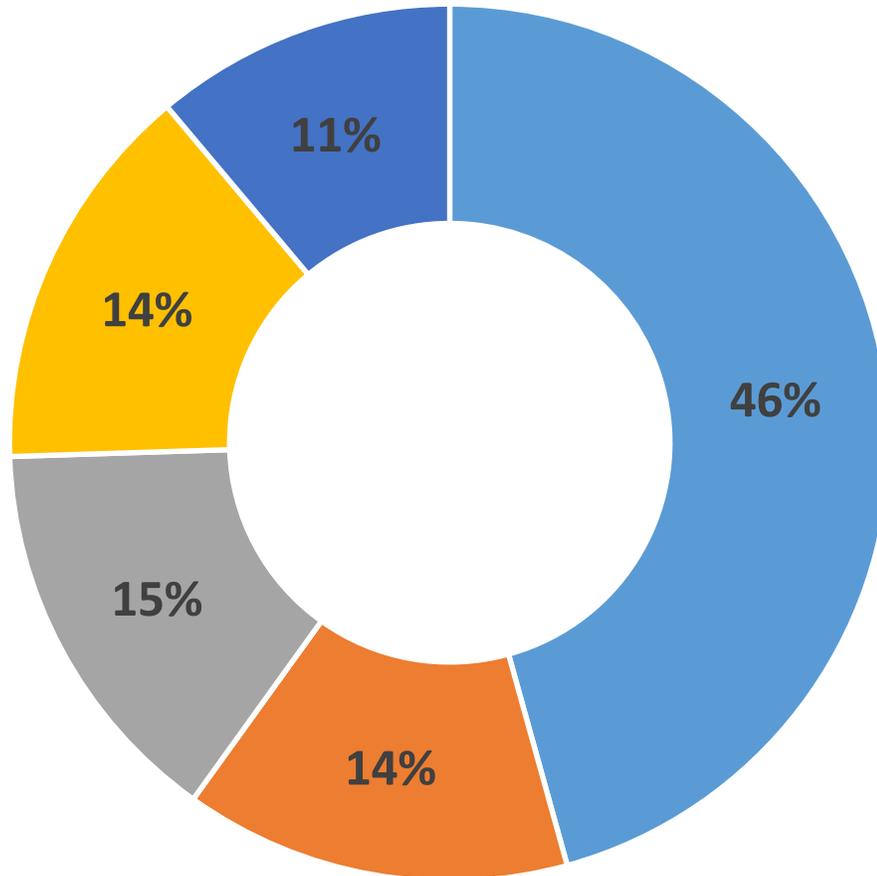
CURRENT TECHNOLOGY FOCUS

What is your personal current technology focus within your organization?



COMPANY PLANS FOR IoT

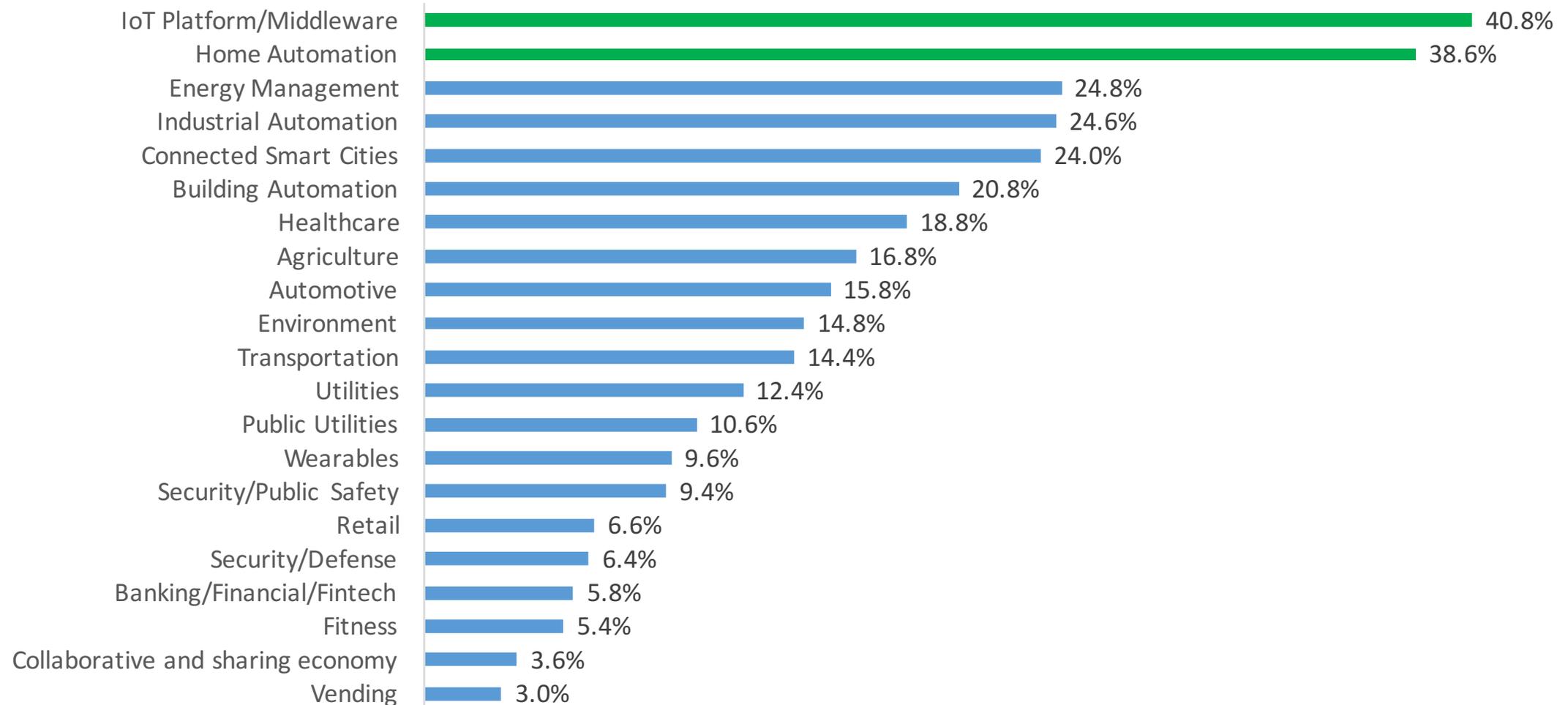
What is your company's plan for IoT solutions?



- My company develops and deploys IoT solutions today
- My company plans to develop and deploy IoT solutions in the next 6 months
- My company plans to develop and deploy IoT solutions in the next 7-18 months
- My company has no plans to develop IoT solutions
- I don't know

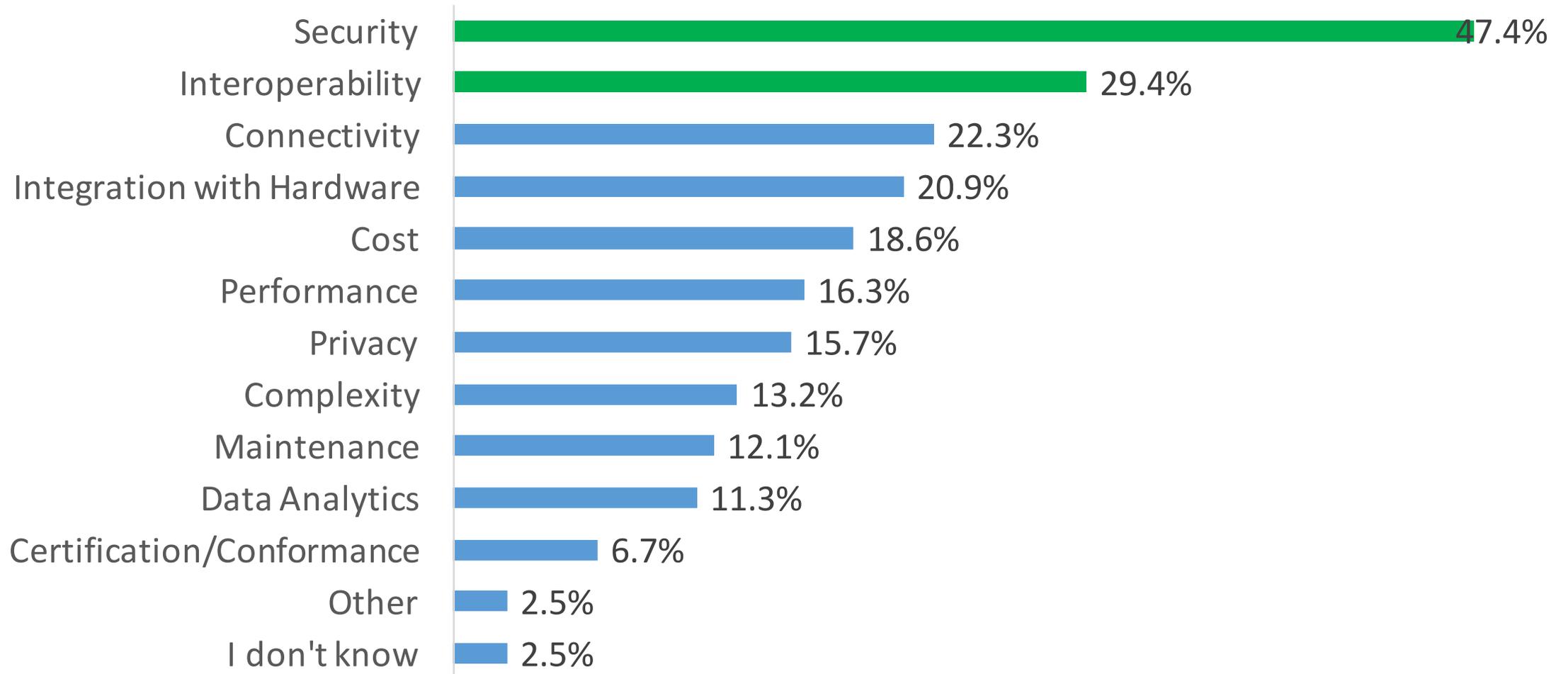
KEY INDUSTRIES

What industry or industries best describe(s) the type of IoT solutions you have built or will build?



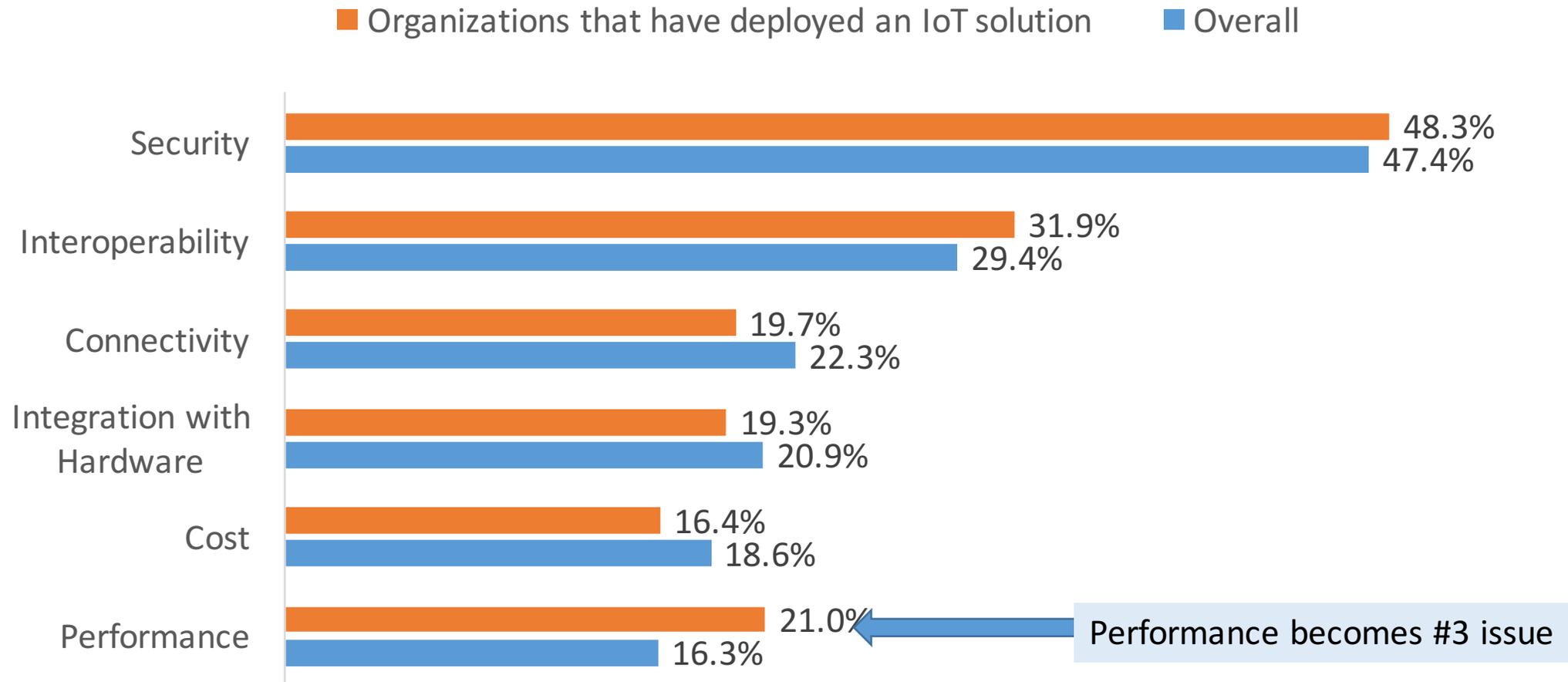
TOP IoT CONCERNS

What are your top 2 concerns for developing IoT solutions?



ORGANIZATIONS THAT HAVE IoT SOLUTIONS TODAY

What are your top 2 concerns for developing IoT solutions?

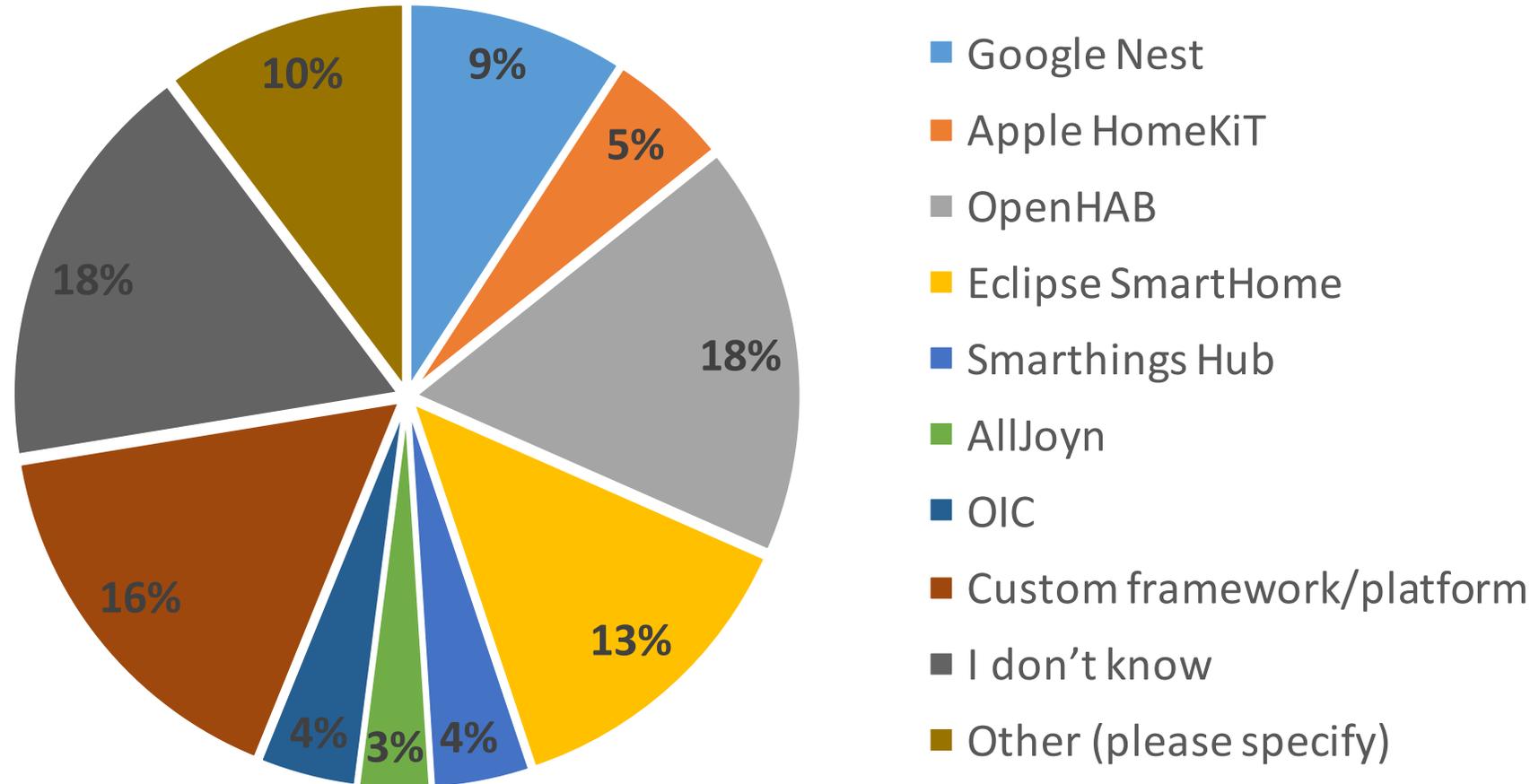




TECHNOLOGY USED FOR IoT

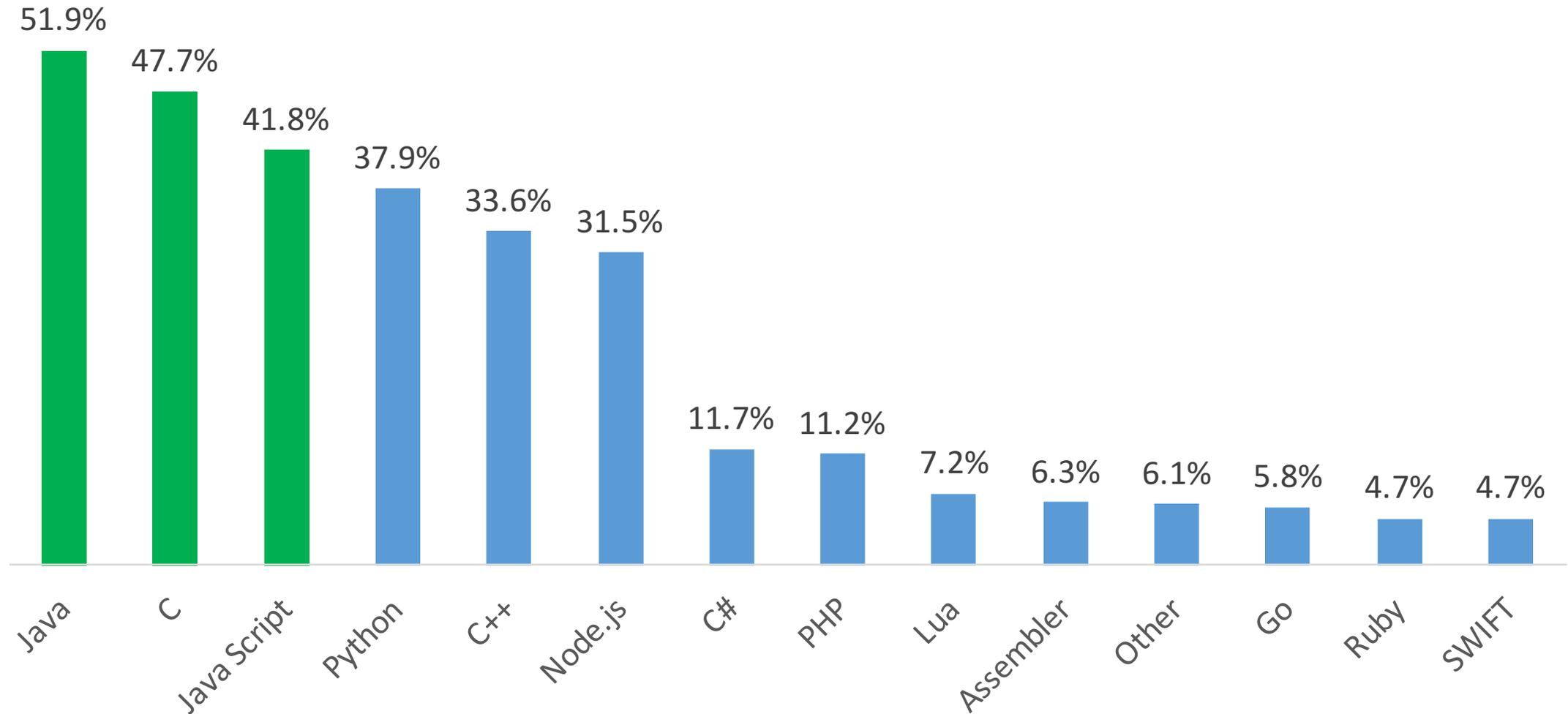
HOME AUTOMATION FRAMEWORKS

For your home automation solution, what framework/platform are you using or plan to use?



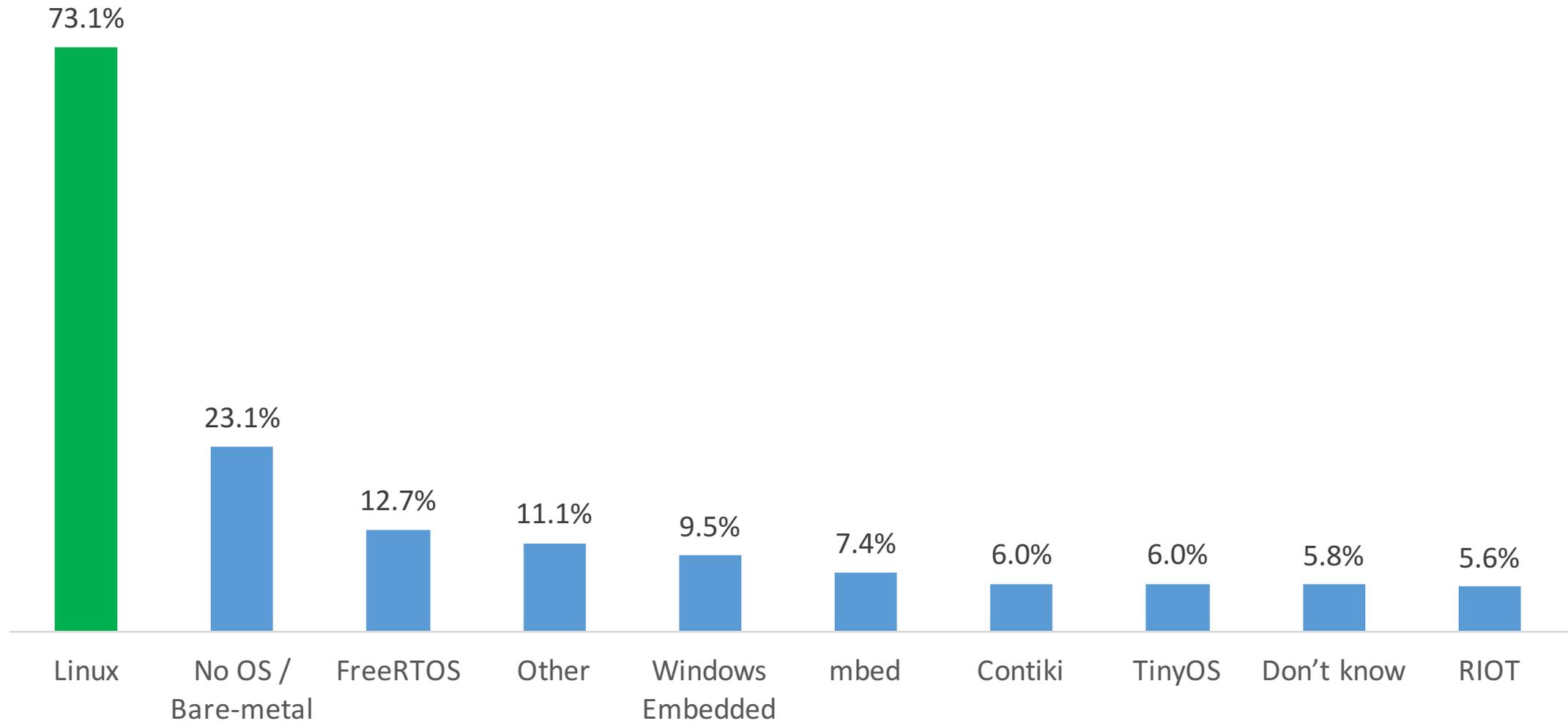
PROGRAMMING LANGUAGES

Which programming languages, if any, do you use to build IoT solutions?



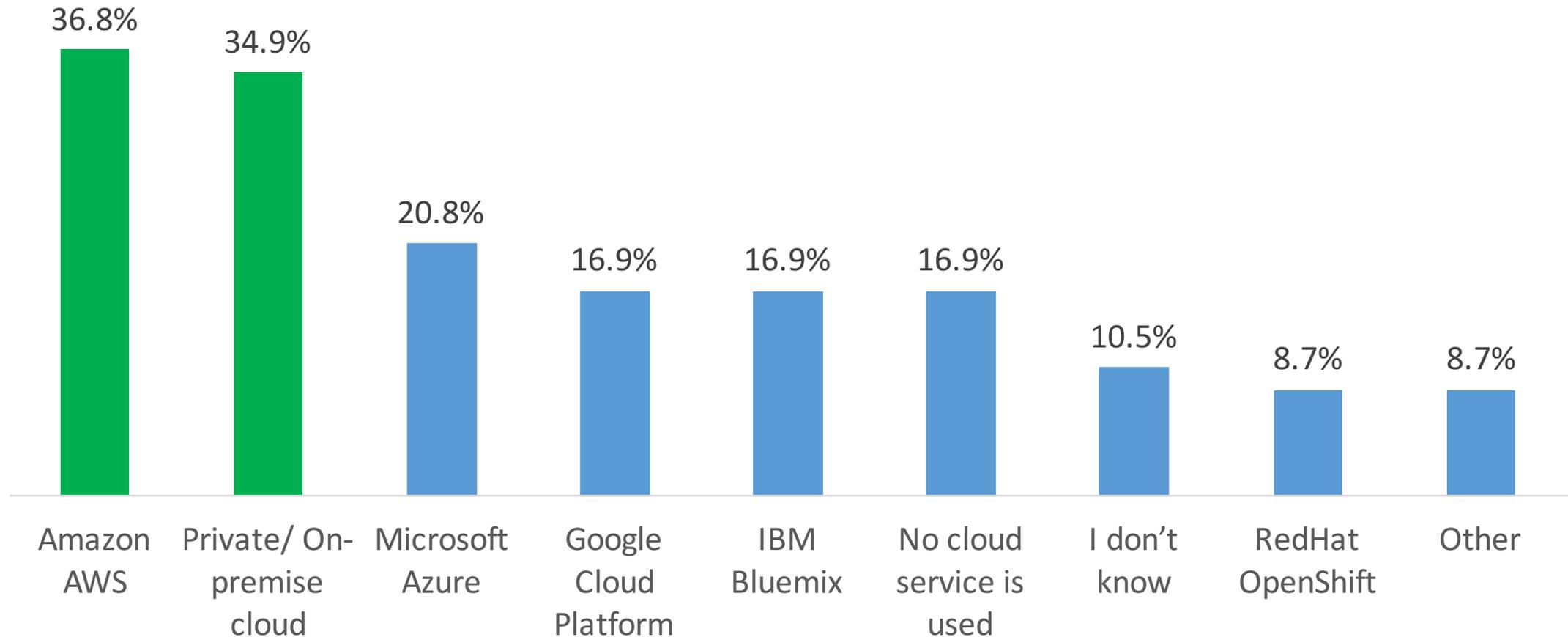
IoT OPERATING SYSTEMS

Which operating system(s) do you use for your IoT devices?



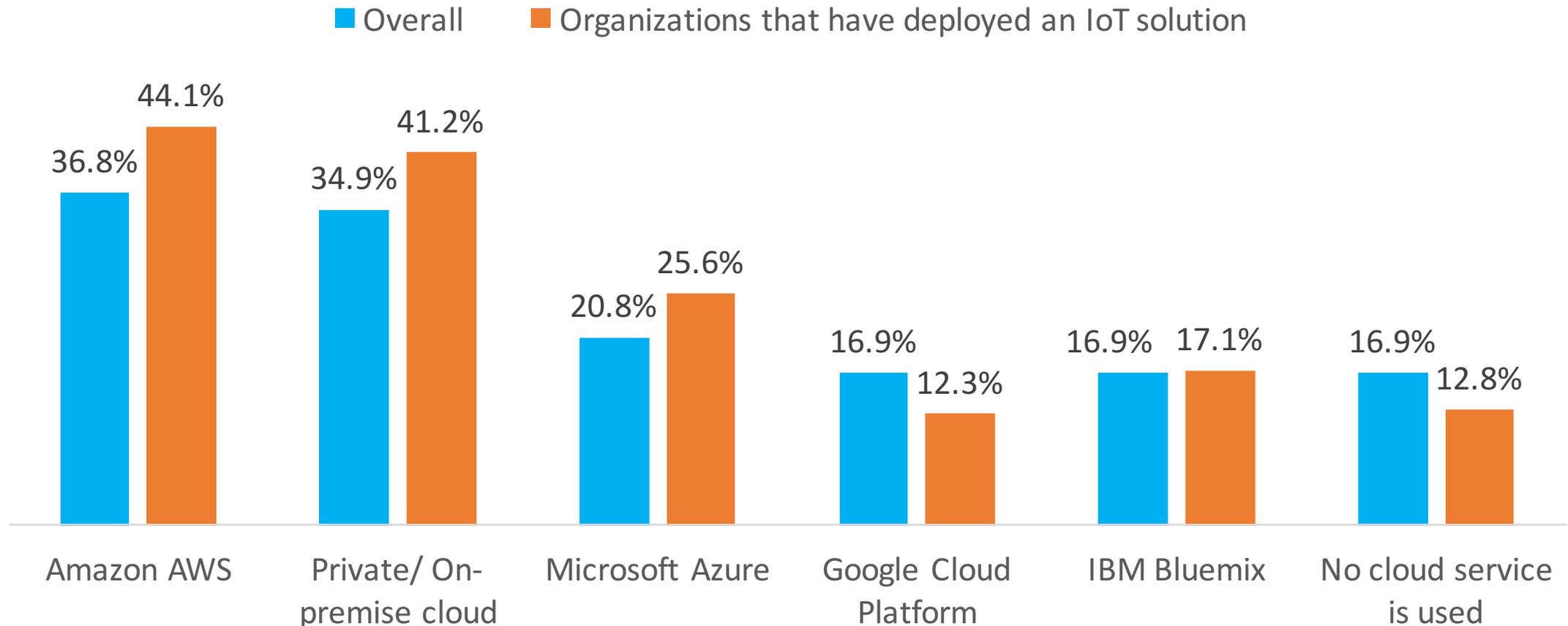
CLOUD SERVICES FOR IOT

Do you use, or plan to use, any of the following cloud service offerings for implementing your IoT solution?



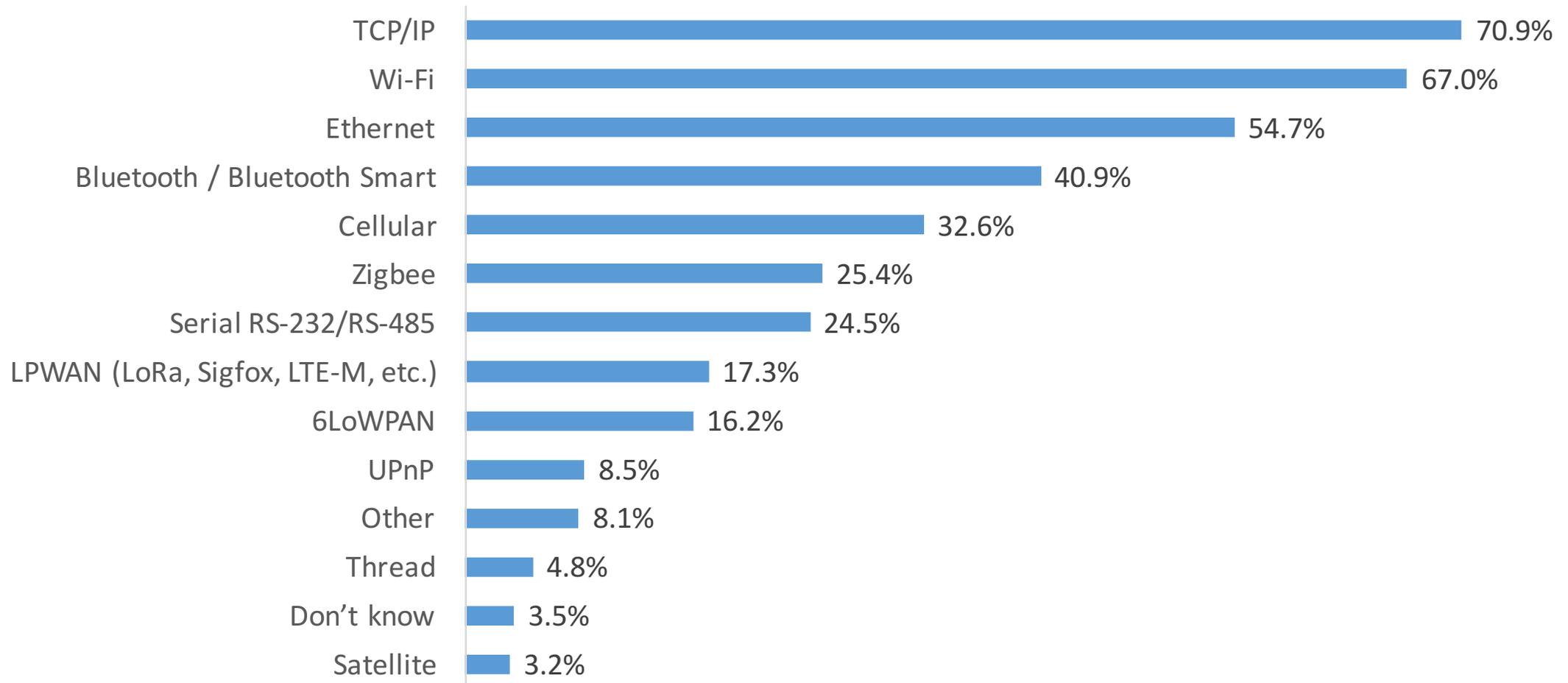
CLOUD SERVICES FOR IoT

Do you use, or plan to use, any of the following cloud service offerings for implementing your IoT solution?



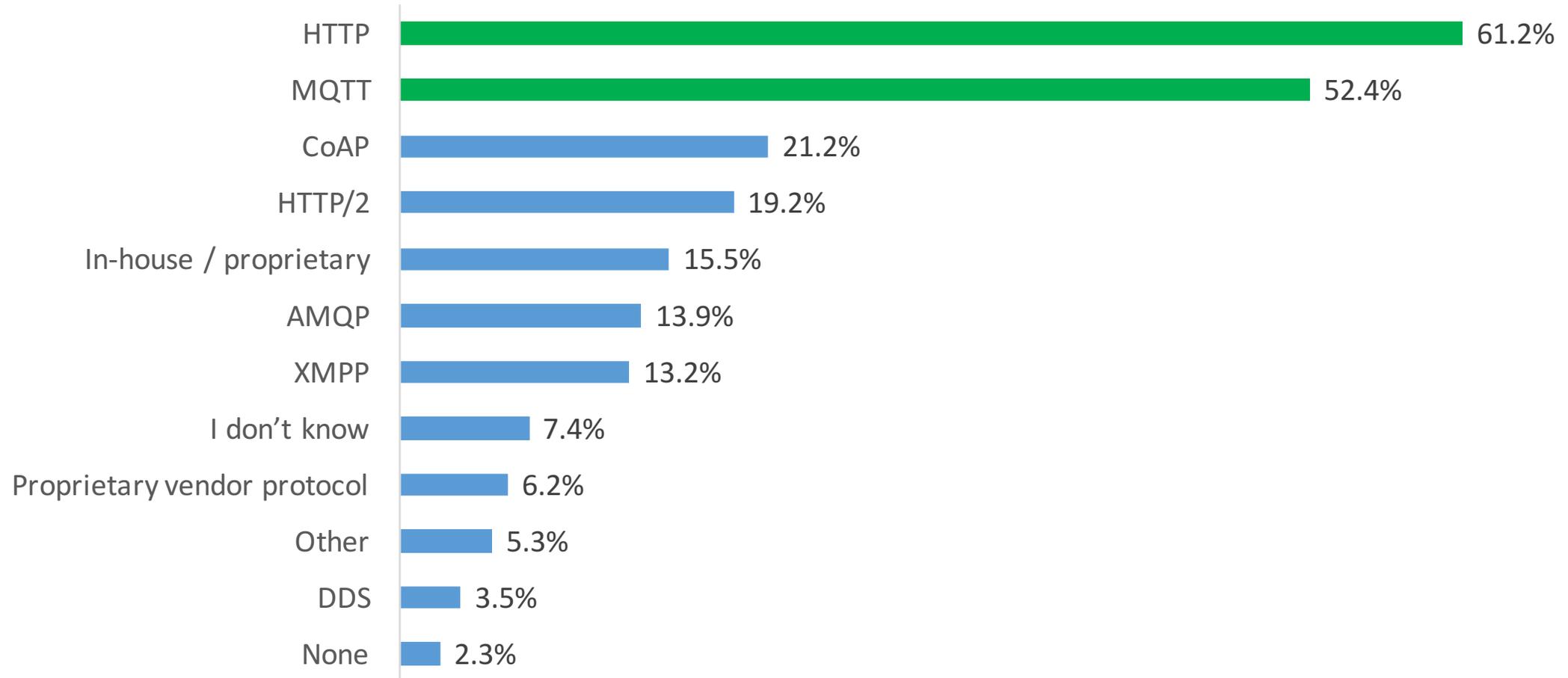
CONNECTIVITY PROTOCOLS

What connectivity protocol(s) do you use for your IoT solution?



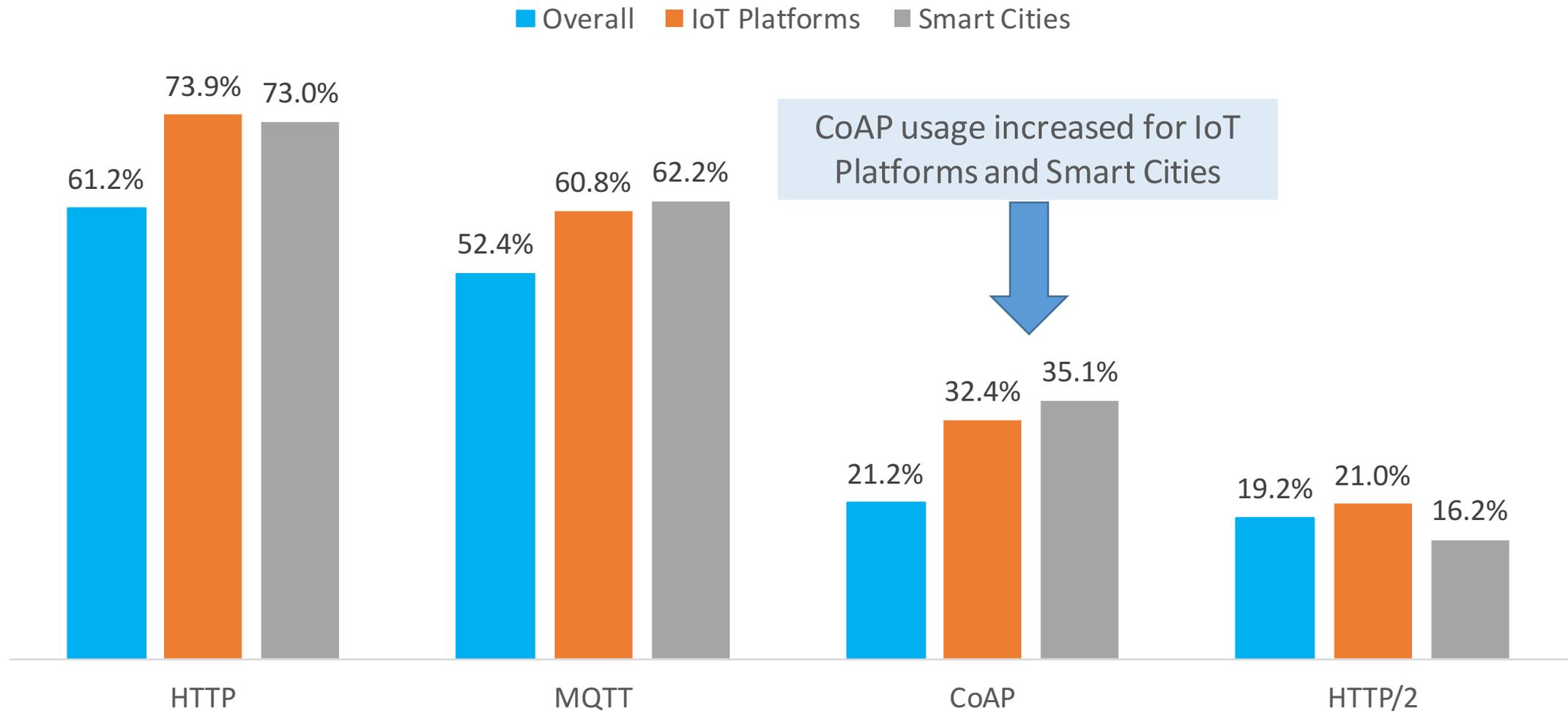
MESSAGING STANDARDS

What messaging protocol(s) do you use for your IoT solution?



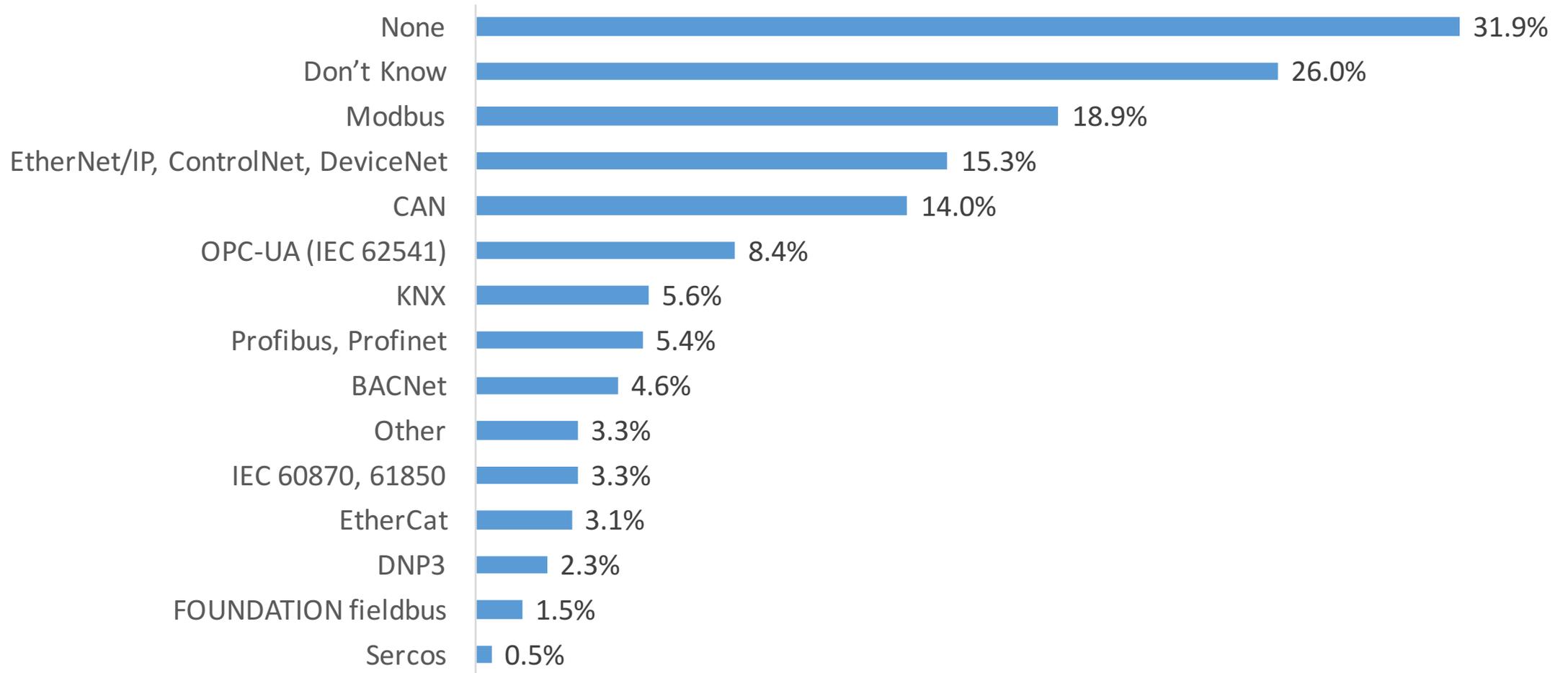
MESSAGING STANDARDS | IoT PLATFORM & SMART CITIES

What messaging protocol(s) do you use for your IoT solution?



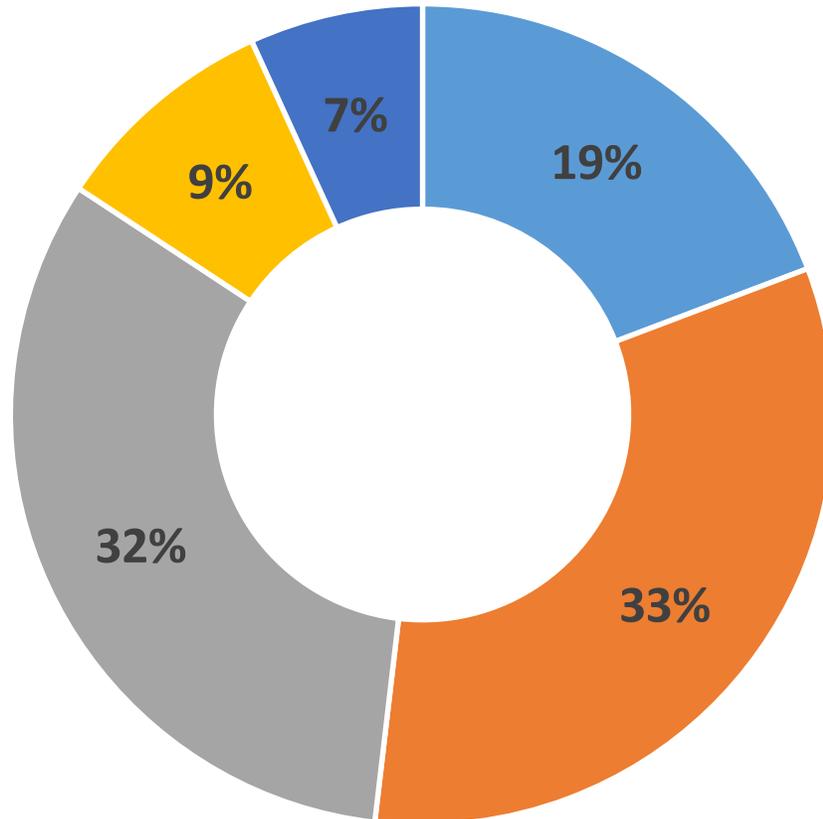
INDUSTRIAL PROTOCOLS

What industrial protocol(s) do you use in your IoT solution?



USAGE OF OPEN HARDWARE

Have you ever used any open hardware platforms like Raspberry Pi, Arduino, BeagleBone, etc.?



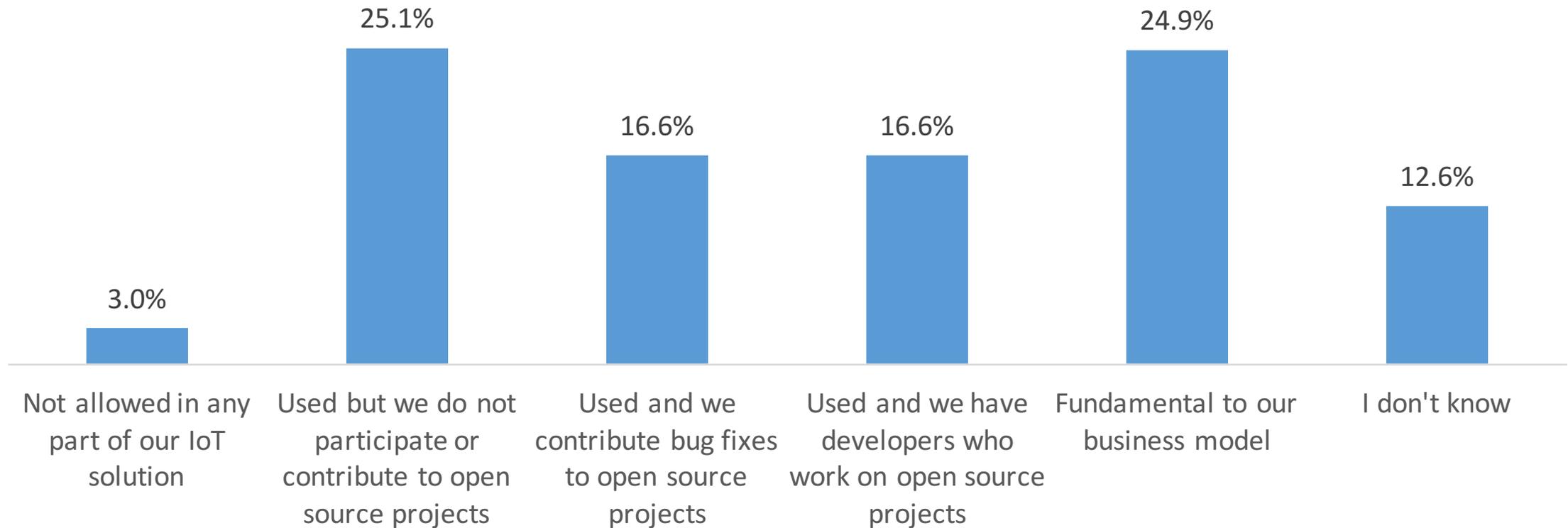
- Yes, my company deploys IoT solution using an open hardware platform
- Yes, my company prototypes IoT solutions using an open hardware platform
- Yes, I have experimented with open hardware in my spare time
- No, but I intend to experiment with open hardware in the next 6 months
- Never used open hardware



IoT INDUSTRY PERCEPTIONS

OPEN SOURCE POLICY

What is your company's policy about using open source technology for your IoT solutions?

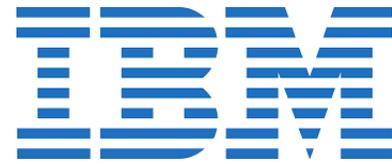
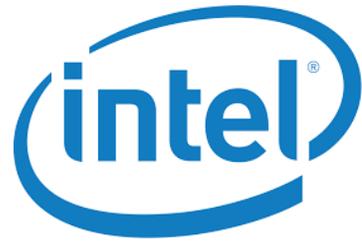


IoT CONSORTIUMS

How would you rank your organization's perceived importance of the following IoT Consortiums to your IoT strategy? (1=Important, 5=Never heard of them)

	Important	Neutral	Not Important	Don't Know	Never heard of them	Average Rating
AllSeen Alliance	38	69	42	73	116	3.47
Eclipse IoT	166	89	29	49	26	2.11
IEC	38	82	37	80	89	3.31
IEEE	135	111	33	65	14	2.20
IETF	104	81	30	66	54	2.66
Industrial Internet Consortium (IIC)	48	90	42	72	87	3.18
LoRa Alliance	70	74	35	71	89	3.10
OASIS	55	103	46	76	64	2.97
Open Interconnect Consortium (OIC)	42	79	39	86	94	3.33
OMA	41	76	32	77	114	3.43
OneM2M	34	78	36	74	112	3.46
Thread	34	81	41	71	108	3.41
W3C	146	88	38	64	13	2.17

TOP IoT CORPORATE LEADERS



BOSCH



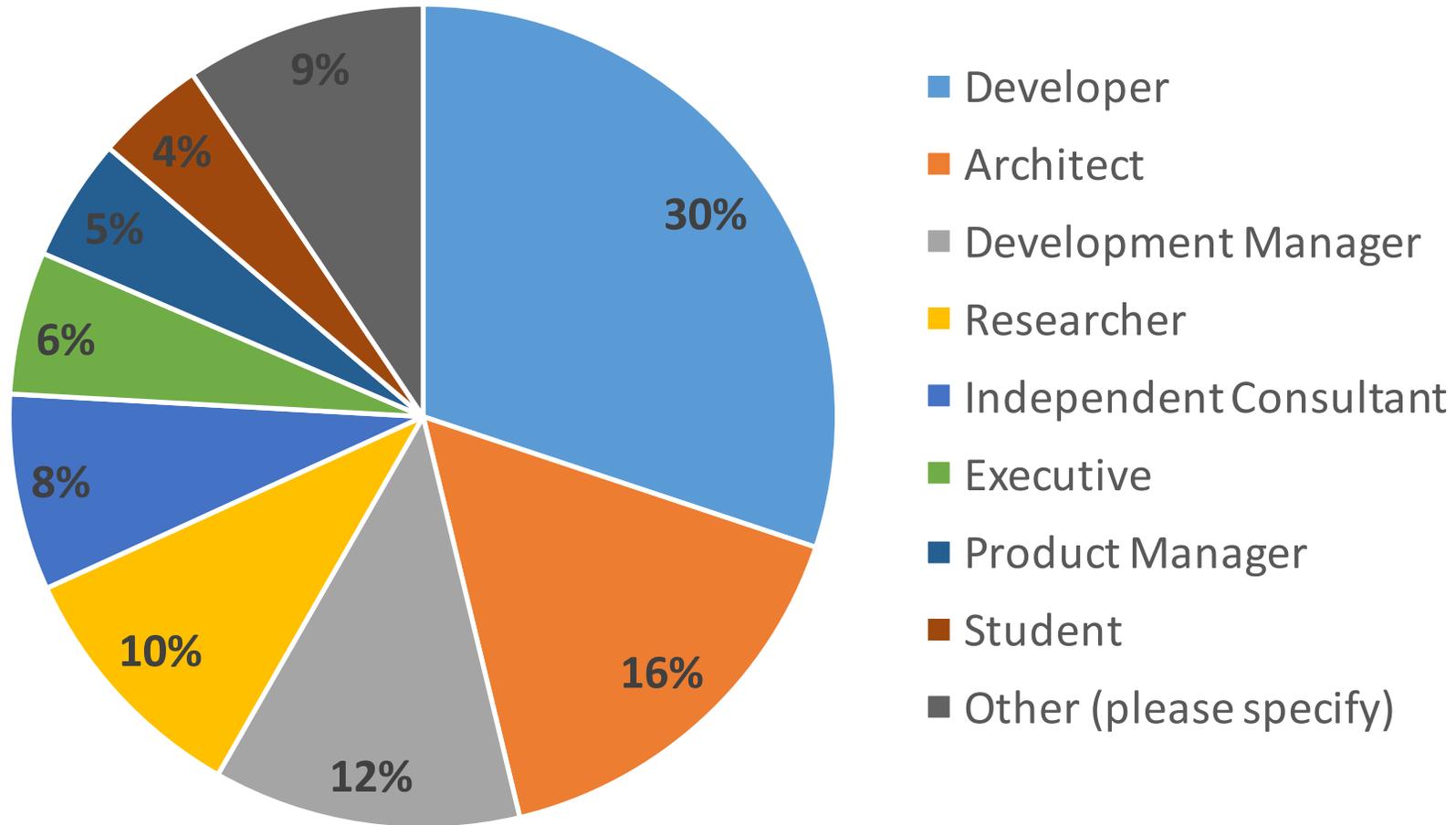
Microsoft





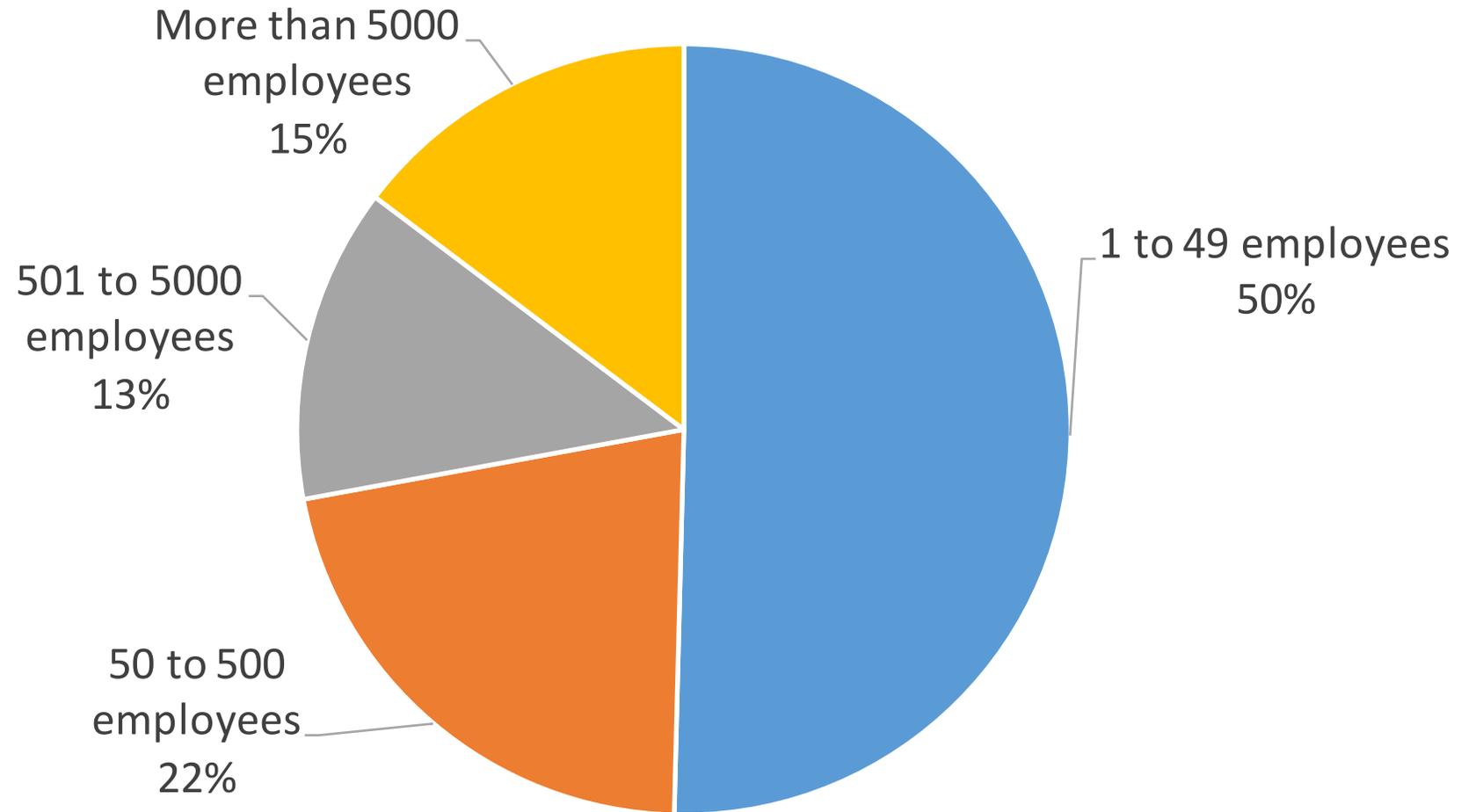
WHO RESPONDED?

JOB TITLE



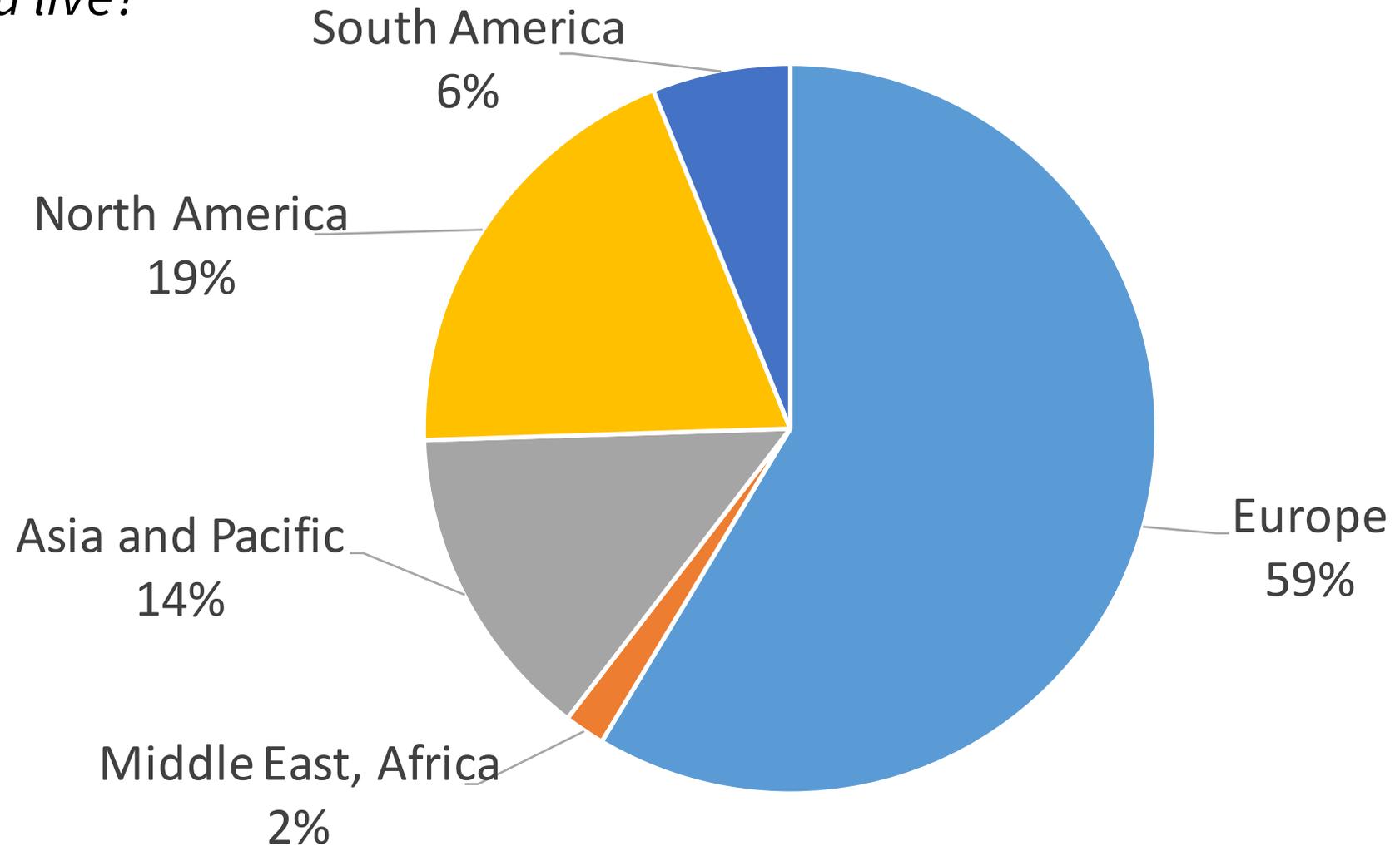
ORGANIZATION SIZE

How large is the organization you work for?



REGION

Where do you live?





DIFFERENT RESPONDENT POOLS

DIFFERENT RESPONDENTS POOLS

The Survey was jointly sponsored by the Eclipse IoT Working Group, IEEE IoT and the AGILE IoT research project. Each sponsor group promoted the survey to their community.

A total of **528 individuals participated in the survey**; 281 from Eclipse IoT, 130 from AGILE IoT and 46 from IEEE IoT. The remaining response came from other organizations who helped promote the survey.

Some differences emerged between the Eclipse IoT respondents and the other groups (details on next page):

- Eclipse community was more focused on embedded technology
- C and Python were top languages in the non-Eclipse respondents; Java and C being top languages in Eclipse
- MQTT usage significantly higher in Eclipse; most likely due to Eclipse Paho and Eclipse Mosquitto
- Eclipse respondents more likely to have already deployed an IoT solution today

KEY DIFFERENCES BETWEEN ECLIPSE IOT RESPONDENTS & THE OTHER GROUPS

	Combined	Eclipse IoT	AGILE IoT, IEEE IoT, others
Embedded Technology Focus	24.9%	30%	19.1%
I develop IoT Solutions for my company	37.9%	46.3%	28.3%
My company develops and deploys IoT solutions today	45.7%	53.1%	37.9%
Top Languages	Java (51.9%) C (47.7%) JavaScript (41.8%)	Java (59.6%) C (45.4%) JavaScript (43.3%)	C (50.5%) Python (47.9%) Java (42%)
Message Protocols	HTTP (61.2%) MQTT (52.4%)	MQTT (61.8%) HTTP (58.1%)	HTTP (65.1%) MQTT (40.6%)
Key Roles	Developer (30.1%) Architect (16.1%) Dev Mgr(12%)	Developer (34.1%) Architect (19.4%) Dev. Mgr (12.4%)	Developer (25.1%) Researcher (16%) Architect (12%)
Location	Europe (58.6%) NA (19.4%) AP (14.1%)	Europe (56.2%) NA (24.4%) AP (13.8%)	Europe (61.5%) AP (14.4%) NA (13.2%)

CONTACT INFORMATION



<https://iot.eclipse.org>

 [@EclipseIoT](https://twitter.com/EclipseIoT)



<http://iot.ieee.org>

 [@IEEEIoT](https://twitter.com/IEEEIoT)



<http://agile-iot.eu>

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