

Survey Questions

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Consent Form (*We provide our informed consent form here*)

Section 1 of 6: Demographic Information

This section asks about demographic information (particularly age, gender, and education).

1 *How do you identify yourself in terms of gender?*

- ☐ Male
- ☐ Female
- ☐ Non-binary / third gender
- ☐ Prefer not to answer
- ☐ Other _____

2 *What is your age?*

- ☐ 18-29 years old
- ☐ 30-39 years old
- ☐ 40-49 years old
- ☐ 50-64 years old
- ☐ 65 years or older
- ☐ Prefer not to answer

3 *What is your highest level of education?*

- ☐ Less than high school
- ☐ High school graduate
- ☐ Some college
- ☐ Vocational degree
- ☐ Bachelor's degree
- ☐ Masters
- ☐ Doctorate
- ☐ Prefer not to answer

4 *Which city do you currently live in?*

Section 2 of 6: Background Information

This section asks questions about your professional background.

5 *What is your current job status?*

- ☐ Freelancer
- ☐ Employed at an organization
- ☐ Both (i.e., work as a freelancer in my free time in addition to being full-time employed)

6 *What is your current job title?*

- ☐ Programmer
- ☐ Tester
- ☐ Project Manager
- ☐ Compliance Expert
- ☐ Other (please specify) _____

7 *How long have you been in this role? (in years)*

8 *How many years of IoT-related working experience do you have?*

9 *What is your company size?*

- ☐ 2-25
- ☐ 26-50
- ☐ 51-100
- ☐ 101-200
- ☐ 201-1000
- ☐ 1000+

10 *Which country is your company based in? (If your company is at multiple offices across different countries, please provide the country of the headquarter.)*

Section 3 of 6: Familiarity with Compliance Standards/IoT Certification

Industry alliances are creating IoT Security standards to set the baseline security criteria for IoT products, such as devices (e.g., Google Nest) and their companion/controller apps (e.g., Google Home). For example, the ioXt alliance uses ioXt standard to certify IoT products. We will henceforth refer to these

consortiums/alliances as “standards bodies”.

IoT Product vendors apply for security assessment and certification based on such standards. The standards bodies delegate the security assessment task to independent, third-party, “Certification Labs”, which evaluate those IoT products for compliance. Compliant products are then given a compliance certificate by the standards bodies.

This section asks questions about your familiarity with IoT compliance standards. Most of the questions are multiple-choice. Questions will explicitly state if you can select multiple choices as answers.

11 *Which type of IoT product are you working on currently? (Please select all that apply)*

- ☐ Device
- ☐ Mobile application
- ☐ Web interface
- ☐ Other (please specify) _____

12 *Please provide the name (with URL, if possible) of the IoT product(s) you have worked on, and are most familiar with. (Optional)*

13 *How knowledgeable would you consider yourself about IoT product security?*

- ☐ Extremely knowledgeable
- ☐ Very knowledgeable
- ☐ Moderately knowledgeable
- ☐ Slightly knowledgeable
- ☐ Not knowledgeable at all

14 *Which of the following IoT Specific Security Compliance Standards are you familiar with? (Please select all that apply.)*

- ☐ ioXt IoT Security Standard
- ☐ GSMA IoT Security Guidelines and Assessment
- ☐ IoTSF IoT Security Assurance Framework
- ☐ IoTAA Internet of Things Security Guideline
- ☐ JPCERT - IoT Security Checklist
- ☐ None
- ☐ Other (please specify) _____

15 *To help us monitor the quality of our data, please select "Somewhat displeased".*

- ☐ Extremely displeased

- ☐ Somewhat displeased
- ☐ Neither pleased nor displeased
- ☐ Somewhat pleased
- ☐ Extremely pleased

16 *Where did you hear/learn about the IoT security compliance standards? (Please select all that apply.)*

- ☐ Learned on-the-job
- ☐ Industry training program
- ☐ From a knowledgeable person/expert
- ☐ Academic
- ☐ Other (please specify) _____

Section 4 of 6: Experience with Certification and IoT Products

This section asks questions about your perception and experience with IoT products and compliance standards.

Questions are either multiple-choice or text-based. While most of the text-based questions are optional, please provide as many details as possible for those questions. Questions will explicitly state if you can select multiple choices as answers.

17 *Have you ever worked on any IoT-related projects that are related to ensuring compliance/certification?*

- ☐ Yes
- ☐ No

18 *Please describe the project you have worked on, or are currently working on. (Optional)*

19 *Which standards are/were relevant to that product? (Please select all that apply)*

- ☐ ioXt IoT Security Standard
- ☐ GSMA IoT Security Guidelines and Assessment
- ☐ IoTSF IoT Security Assurance Framework
- ☐ IoTAA Internet of Things Security Guideline
- ☐ JPCERT - IoT Security Checklist
- ☐ None
- ☐ Other (please specify) _____

20 *How is a particular certification standard chosen at your organization?*

21 *What is the process of certifying your product? (Please select all that apply)*

- ☐ Self-certification
- ☐ From third-party certification lab
- ☐ Do not know
- ☐ Other (please specify) _____

22 *How has compliance certification influenced the security of your product?*

- ☐ Positively, i.e., it makes the product more secure
- ☐ No impact, i.e., the product would be just as secure (or vulnerable) without compliance certification
- ☐ Negatively, i.e., it makes the product less secure

23 *Please explain your response to the previous question.*

24 *How has compliance certification affected the ability to release products to customers on time?*

- ☐ No impact
- ☐ Delays release
- ☐ Speeds up release

25 *Please explain your response to the previous question.*

26 *“IoT Security standards are important for the security of the product.” - Do you agree or disagree with this statement?*

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Neither agree nor disagree
- ☐ Somewhat disagree
- ☐ Strongly disagree

27 *Please explain your response to the previous question.*

28 *How responsible should the following entities be considered for the correct enforcement of IoT compliance standards/certification?*

	Extremely responsible	Very responsible	Moderately responsible	Slightly responsible	Not Responsible at all
The developer of the IoT product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The certification lab that certified IoT Product	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The standards body that authorized/licensed the certification lab	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The user	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

29 *Any other details you would like to mention here: (Optional)*

30 *If a vulnerability within the scope of the certification standard is found in the certified product, would that make the developer liable?*

☐ Yes

☐ No

31 *Please explain your response to the previous question.*

32 *If a vulnerability within the scope of the certification standard is found in a certified product, would that make the certification lab that certified the product liable?*

☐ Yes

☐ No

33 *Please explain your response to the previous question.*

34 *Consider a certified IoT app that is used by millions of users. However, security researchers find the app to be vulnerable in a way that allows an attacker to steal sensitive audio/video data that the app receives from devices such as baby monitors, air conditioners, and smart cameras.*

In this scenario, how liable do you think each of the following entity is, for this particular information leak?

	Extremely liable	Very liable	Moderately liable	Slightly liable	Not liable at all
The developer of the IoT app	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The certification lab that certified IoT app	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The standards body that authorized/licensed the certification lab	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>
The user	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>	<input type="radio"/>

35 *Please explain your response to the previous question. (Optional)*

36 *“A vulnerability in a certified product indicates a failure of the security compliance process”
- Do you agree or disagree with this statement?*

- ☐ Strongly agree
- ☐ Somewhat agree
- ☐ Neither agree nor disagree
- ☐ Somewhat disagree
- ☐ Strongly disagree

37 *Please explain your response to the previous question.*

Section 5 of 6: Challenges and Expectations

This section will ask about challenges you have experienced and your expectations.

Questions are either multiple-choice or text-based. While most of the text-based questions are optional, please provide as many details as possible for those questions. Questions will explicitly state if you can select multiple choices as answers.

38 *Have you ever encountered a vulnerability in a certified product, which was supposed to be covered through the certification process?*

- ☐ Yes
- ☐ No

39 *Please explain your response to the previous question. (If 'yes' is selected)*

40 *Have you experienced any challenges while ensuring compliance/certification of IoT products? Please elaborate. (Optional)*

41 *In your opinion, what should be done to improve the current certification process? Please elaborate. (Optional)*

Section 6 of 6: Feedback & Follow-Up Interview

Thank you very much for completing our survey.

We welcome any additional feedback that you might have on this survey. Additionally, we would like to conduct follow-up interviews with willing participants. If you are interested, please provide your consent in the question below.

All the questions in this section are optional.

42 *Do you have any relevant comments or opinions that you want to share, but was not covered in the survey? If so, please provide here:*

43 *Do you know anyone who may provide us with valuable insight related to certified IoT products and /or certification standards? if yes, please provide their email addresses here:*

44 *Please enter your email address to receive monetary compensation (Amazon gift card) for voluntary participation in the study. Note that compensation will be awarded only for complete survey responses. Your email address will not be shared or published.*

45 *Do you want to allow us to contact you to ask possible follow-up interviews? If yes, please provide your preferred contact information.*

End of our survey

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