

## NIST Smart Home Security & Privacy Study Screenshots

5 January 2022

### First Screen

#### Smart Home Security and Privacy Survey

OMB #0693-0043 3/31/2022

This survey is being conducted on behalf of the National Institute of Standards and Technology (NIST), which, in part, works with industry and other agencies to develop information technology (IT) standards and cultivate trust in IT. For this effort, NIST is interested in users of smart home devices and their thoughts about the security and privacy of those devices. NIST has partnered with Fors Marsh Group (FMG), an independent research firm, to administer this survey and learn more about consumers' smart home security and privacy concerns, actions, information sources, and expectations. Your responses will assist NIST in improving standards for smart home devices.

Please know that nothing you share will be connected to your name. We are collecting this information strictly to inform our research, and all of your information will be kept confidential.

It is important that you know the following information before you decide to complete the survey:

- **Purpose:** This study is being performed to understand consumers' smart home security and privacy concerns, actions, information sources, and expectations.
- **Duration:** We anticipate that your participation in this research study will take approximately 20 minutes.
- **Procedures and Activities:** You will complete an online survey regarding your security and privacy concerns, actions, and perceptions related to your smart home devices. Your survey response will be collected without any personal identifiers.
- **Voluntary consent:** Taking part in this study is completely voluntary. You may decide to participate or not participate.
- **Risks and Benefits:** This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. You will not benefit directly by participating in the study. The long-term benefits of this study should be improved standards for the usability, security, and privacy of smart home devices.

We also have more detailed information available to you about this survey and your privacy. Select the additional pages you would like to read below, if any, before proceeding with the survey.

☐ NIST Information Sheet

By continuing with the survey, you acknowledge that the following is true for you:

**I understand the above description of the research and the risks and benefits associated with my participation as a research subject. I understand that by proceeding with this survey I agree to take part in this research and do so voluntarily.**

If you have any technical issues while taking the survey, please email the help desk at [NISTHomeSurvey@forsmarshgroup.com](mailto:NISTHomeSurvey@forsmarshgroup.com). If you have any questions regarding incentives, please contact [surveysupport@swagbucks.com](mailto:surveysupport@swagbucks.com).

Thank you for your time and participation! When you are ready to begin the survey, click Next.

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A Federal agency may not conduct or sponsor, and a person is not required to respond to, nor shall a person be subject to a penalty for failure to comply with an information collection subject to the requirements of the Paperwork Reduction Act of 1995 unless the information collection has a currently valid OMB Control Number. The approved OMB Control Number for this information collection is 0693-0043. Without this approval, we could not conduct this survey. Public reporting for this information collection is estimated to be approximately 20 minutes per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the information collection. All responses to this information collection are voluntary. Send comments regarding this burden estimate or any other aspect of this information collection, including suggestions for reducing this burden to the National Institute of Standards and Technology at: Attn: Julie Haney, 100 Bureau Drive, Gaithersburg, MD 20899 or [julie.haney@nist.gov](mailto:julie.haney@nist.gov).

# Information Sheet:

## Smart Home Security and Privacy Survey

### Information Sheet for Study

**Principal Investigator:** Julie Haney, National Institute of Standards and Technology

**Study Title:** Smart Home Security and Privacy Survey

**Study Site(s):** Online survey is administered by Fors Marsh Group

#### Key Information

*This is a brief summary of key information to describe the research study you are being invited to participate in. You will find more detailed information explained later in this document.*

- **Purpose:** This study is being performed to understand consumers' smart home security and privacy concerns, actions, information sources, and expectations.
- **Duration:** We anticipate that your participation in this research study will take approximately 20 minutes.
- **Procedures and Activities:** You will complete an online survey regarding your security and privacy concerns, actions, and perceptions related to your smart home devices. Your survey response will be collected without any personal identifiers.
- **Voluntary consent:** Taking part in this study is completely voluntary. You may decide to participate or not participate.
- **Risks and Benefits:** This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. You will not benefit directly by participating in the study. The long-term benefits of this study should be improved standards for the usability, security, and privacy of smart home devices.

#### Introduction

You are being asked to take part in a research study. Research studies include only people who choose to take part. This document is called an information sheet and is for you to read carefully before you make your decision about participating in the study. Ask the researcher or study staff to discuss this information sheet with you. Please ask them to explain any words or information you do not clearly understand. The nature of the study, risks, inconveniences, discomforts, and other important information about the study are provided below.

The person who is in charge of this research study is Julie Haney. This person is called the Principal Investigator. However, other research staff may be involved and can act on behalf of the person in charge.

#### Purpose of the study

This study is being performed to understand consumers' smart home security and privacy concerns, actions, information sources, and expectations. To gain this understanding, we are conducting a survey of smart home users from across the United States. Study results will contribute to the development of standards that reflect the security and privacy needs and preferences of smart home consumers. The research is funded and conducted by the National Institute of Standards and Technology (NIST).

#### Why are you being asked to take part?

We are asking you to take part in this research study because you are an adult who lives in the U.S. and are an active user of a smart home device in at least one of the following categories: virtual voice assistants (e.g., Amazon Alexa); smart thermostats (e.g., Nest, Ecobee); smart security devices (e.g., cameras, video doorbells, garage door openers); smart environment sensors (e.g., smoke or leak detectors); and smart lighting (e.g., lightbulbs, lighting systems).

#### Study Procedures:

If you take part in this study, you will be asked to do the following:

- In the online survey, select the types/categories of smart home devices that you own or use in your household. You will be asked to complete the survey based on your experiences with devices in only one of those device categories.
- You will be asked questions about your views on the security and privacy of your smart home devices, including: your security and privacy concerns (if any); what actions you take to alleviate those concerns (if any); who you think is responsible for the security and privacy of your devices; and what information sources (if any) you use to learn more about the security and privacy of your devices. You will also be asked some questions about yourself.
- The study should take you approximately 20 minutes to complete.

#### Total Number of Participants

About 400 individuals will take part in this online survey.

#### Voluntary Participation / Withdrawal

You do not have to participate in this research study.

You should only take part in this study if you want to volunteer. You should not feel that there is any pressure to take part in the study. You are free to participate in this research or withdraw at any time. There will be no penalty or loss of benefits you are otherwise entitled to receive if you stop taking part in this study. You may withdraw from the study by exiting without submitting the survey. If you exit the survey before submitting, your data will be removed from the research record. However, once you have submitted the survey, your data cannot be removed since there will be no way to associate your response with your identity since survey responses are collected anonymously.

#### Risks or Discomfort

This research is considered to be minimal risk. That means that the risks associated with this study are the same as what you face every day. There are no known additional risks to those who take part in this study. There is also a very small risk that someone who is not authorized could get access to the data. However, we describe how we will protect your confidentiality in a later section of this information sheet.

#### Costs

It will not cost you anything to take part in the study.

#### Privacy and Confidentiality

We will keep your study records private and confidential. Your survey responses will be assigned an identification number that will not be linked back to you. All survey data will be stored on an encrypted computer or hard drive in a locked office. Certain people may need to see your study records. Anyone who looks at your records must keep them confidential. These individuals include:

- The research team, including the Principal Investigator, study coordinator, and all other research staff.
- Certain government people who need to know more about the study, and individuals who provide oversight to ensure that we are doing the study in the right way.
- Any agency of the federal, state, or local government that regulates this research, including the Office for Human Research Protection (OHRP).

Your identity will be protected to the extent permitted by law, including the Freedom of Information Act. We may publish what we learn from this study. If we do, we will not include your name. We will not publish anything that would let people know who you are. Total confidentiality cannot be guaranteed, since all security measures have vulnerabilities and may be compromised.

#### Future use of research data and/or specimens

The survey data will be retained for study record keeping per NIST institutional policy. Data will not be used for any additional research studies.

#### You can get the answers to your questions, concerns, or complaints

If you have any questions, concerns, or complaints about this study or experience an unanticipated problem or research-related injury, call or email Julie Haney at 301-975-5772 or [julie.haney@nist.gov](mailto:julie.haney@nist.gov).

If you have questions about your rights as a participant in this study or have complaints, concerns or issues you want to discuss with someone outside the research team, call the Research Protections Office (RPO) at (301) 975-5445.

You should only decide to participate if the following is true for you:

I understand the above description of the research and the risks and benefits associated with my participation as a research subject. I understand that by proceeding with this survey I agree to take part in this research and do so voluntarily.

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## Smart Home Security and Privacy Survey

Throughout the survey, the following terms are used:

- **Smart home device** is a network-connected device (connected via Wi-Fi, Bluetooth, or similar technologies) that is used to remotely and/or more effectively and easily control functions or physical aspects of the home.
- **Smart home device app** is an application on your smartphone, computer, laptop, or tablet that is used to remotely control or access your smart home device.
- In the context of the survey, **security** refers to the technologies and techniques used to protect smart home devices and the data (information) they collect from unauthorized access or digital (cyber) attack. In this survey, "security" is equivalent to "cybersecurity." Physical security related to the home or its occupants is different and will be referred to as "home security."
- **Privacy** refers to the state in which individuals feel free from unwarranted observation or intrusions, including the right of a device owner or user to maintain control over and be assured confidentiality of any personal information that is collected, transmitted, used, and stored while using smart home devices.

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### Question 1:

## Smart Home Security and Privacy Survey

### Smart Home Devices

Which of the following smart home devices do you own or use in your house? (Select all that apply.)

*Remember: A smart home device is a network-connected device (connected via Wi-Fi, Bluetooth, or similar technologies) that is used to remotely and/or more effectively and easily control functions or physical aspects of the home.*

- ☒ Virtual voice assistants and smart speakers (e.g., Amazon Echo/Alexa, Google Nest Home Hub, Apple HomePod)
- ☐ Thermostats (e.g., Nest, Ecobee)
- ☐ Home security devices (e.g., video doorbells, cameras, door locks, garage door openers)
- ☐ Home environment sensors (e.g., smoke and leak detectors)
- ☐ Lighting devices (e.g., lightbulbs, lighting systems). This category does **not** include smart plugs that control lights.

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## Question 2:

### Smart Home Security and Privacy Survey

#### Smart Home Devices

Unless otherwise indicated, please answer the following questions based on your virtual voice assistants and smart speakers (e.g., Amazon Echo/Alexa, Google Nest Home Hub, Apple HomePod) only.

How many virtual voice assistants and smart speakers (e.g., Amazon Echo/Alexa, Google Nest Home Hub, Apple HomePod) do you own or use in your house?

- ☐ 1 device
- ☐ 2 to 3 devices
- ☐ 4 to 5 devices
- ☐ 6 to 7 devices
- ☐ 8 or 9 devices
- ☐ 10 or more devices

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## Smart Home Security and Privacy Survey

Unless told otherwise, please answer the following questions for your virtual voice assistants and smart speakers (e.g., Amazon Echo/Alexa, Google Nest Home Hub, Apple HomePod) only.

Remember:

- **Security** refers to the technologies and techniques used to protect smart home devices and the data (information) they collect from unauthorized access or digital (cyber) attack. In this survey, "security" is equivalent to "cybersecurity." Physical security related to the home or its occupants is different and will be referred to as "home security."
- The **privacy** of smart home devices refers to the right of a party to maintain control over and be assured confidentiality of personal information that is collected, transmitted, used, and stored during the use of smart home devices.

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### Question 3:

## Smart Home Security and Privacy Survey

### Security and Privacy Concerns and Actions

Regarding what you think is *currently* true about your virtual voice assistants and smart speakers (e.g., Amazon Echo/Alexa, Google Nest Home Hub, Apple HomePod), please rate your level of agreement with the following:

|                                                                   | Strongly Disagree     | Disagree              | Neutral               | Agree                 | Strongly Agree        |
|-------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I think that most of these smart home devices are secure.         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I think that most of these smart home devices protect my privacy. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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**Question 4:**

**Smart Home Security and Privacy Survey**

**Security and Privacy Concerns and Actions**

How concerned are you with the following for your virtual voice assistants and smart speakers?

|                                              | Not at all<br>Concerned | Slightly<br>Concerned | Somewhat<br>Concerned | Moderately<br>Concerned | Extremely<br>Concerned |
|----------------------------------------------|-------------------------|-----------------------|-----------------------|-------------------------|------------------------|
| The <u>security</u> of my smart home devices | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   | <input type="radio"/>  |
| The <u>privacy</u> of my smart home devices  | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>   | <input type="radio"/>  |

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## Question 5:

### Smart Home Security and Privacy Survey

#### Security and Privacy Concerns and Actions

Regarding your virtual voice assistants and smart speakers, please rate your level of agreement with the following statements:

|                                                                               | Strongly Disagree     | Disagree              | Neutral               | Agree                 | Strongly Agree        |
|-------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I understand the <u>security</u> risks associated with my smart home devices. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I understand the <u>privacy</u> risks associated with my smart home devices.  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question 6:

Smart Home Security and Privacy Survey

Security and Privacy Concerns and Actions

For each of the following security-related scenarios involving your virtual voice assistants and smart speakers, please rate your level of concern.

|                                                                                                                                                                       | Not at All Concerned  | Slightly Concerned    | Somewhat Concerned    | Moderately Concerned  | Extremely Concerned   |
|-----------------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| A security problem with my smart home data exposing members of my household to identity theft or financial loss.                                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A security problem with my smart home device leading to unauthorized access to my other devices (e.g., smartphones, computers, tablets, or other smart home devices). | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A security problem with my smart home device leading to my device being used as part of a <a href="#">botnet</a> .                                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

## Question 7:

### Smart Home Security and Privacy Survey

#### Security and Privacy Concerns and Actions

For each of the following privacy-related scenarios involving your virtual voice assistants and smart speakers, please rate your level of concern.  
"Others" can refer to device manufacturers, advertisers, hackers/attackers (unauthorized individuals), the government, or other third-party organizations.

|                                                                                                                                                             | Not at all Concerned  | Slightly Concerned    | Somewhat Concerned    | Moderately Concerned  | Extremely Concerned   |
|-------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Others using my smart home data in ways that I don't expect or authorize.                                                                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Others misrepresenting my smart home data in an inaccurate, insulting, or unflattering manner.                                                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Having to provide more personal or private information than I feel comfortable with when setting up or using my smart home device.                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Others using my smart home data to uniquely identify members of my household.                                                                               | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Others using my smart home data to create inferences/assumptions about members of my household that could result in embarrassment or discrimination.        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Others tracking or monitoring my smart home data or usage in a manner that could result in physical harm to members of my household.                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Others tracking or monitoring my smart home data or usage in a manner that could result in a violation of the individual rights of members of my household. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Others collecting and combining different kinds of smart home data and revealing private things about members of my household.                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Members of my household not having awareness of what data is being collected by my smart home devices.                                                      | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Members of my household not having awareness of how data collected by my smart home devices is being used.                                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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If respondent selects “Not at all concerned” or “Slightly Concerned” for all of the items in Question 7, they will see this version of Question 8:

**Question 8A:**

**Smart Home Security and Privacy Survey**

**Security and Privacy Concerns and Actions**

What are some reasons why you may have slight or no privacy or security concerns? (Select all that apply.)

- ☐ The benefits of using this type of device outweigh the risks
- ☐ My data/devices aren't interesting enough for someone to target
- ☐ The chances of this type of device being hacked are low
- ☐ The actions I take on my own alleviate my concerns
- ☐ The consequences of this type of device being hacked would be minimal
- ☐ My devices are already secure
- ☐ I trust the device manufacturers to protect my privacy
- ☐ I understand how my data will be collected and used
- ☐ I believe that I have control over my data
- ☐ My data is out there anyway
- ☐ I have nothing to hide
- ☐ I don't know
- ☐ Other, please specify

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If respondents answers “Somewhat Concerned,” “Moderately Concerned,” or “Extremely Concerned” for at least one of the items in Question 7, they will see this version of Question 8:

**Question 8B:**

**Smart Home Security and Privacy Survey**

**Security and Privacy Concerns and Actions**

What are some reasons why you still use your virtual voice assistants and smart speakers even if you have privacy or security concerns? (Select all that apply.)

- ☐ The benefits of using this type of device outweigh the risks
- ☐ My data/devices aren't interesting enough for someone to target
- ☐ The chances of this type of device being hacked are low
- ☐ The actions I take on my own alleviate my concerns
- ☐ The consequences of this type of device being hacked would be minimal
- ☐ My devices are already secure
- ☐ I trust the device manufacturers to protect my privacy
- ☐ I understand how my data will be collected and used
- ☐ I believe that I have control over my data
- ☐ My data is out there anyway
- ☐ I have nothing to hide
- ☐ I don't know
- ☐ Other, please specify

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## Question 9:

### Smart Home Security and Privacy Survey

#### Security and Privacy Concerns and Actions

Which of the following actions have you taken for your virtual voice assistants and smart speakers? (Select all that apply.)

- ☐ Set a password or PIN on my smart home device/app
- ☐ Used two-factor or biometric authentication (e.g., password plus verification code, face recognition, fingerprint authentication) on my smart home device/app
- ☐ Been careful about not placing my smart home devices in more sensitive or private areas of my home
- ☐ Been careful about what I do/say when near my smart home devices
- ☐ Set up or changed specific security/privacy settings on my smart home devices
- ☐ Limited the amount of information I enter in my smart home device app
- ☐ Installed updates to my smart home devices when available or set the devices to automatically update
- ☐ Limited who can perform certain actions (e.g., voice-assisted ordering, changing settings) on my smart home devices
- ☐ Other privacy or security related actions, please specify:
- ☐ I haven't done any of these
- ☐ I don't know or am not sure - I am not the person in my household who takes these actions.

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## Question 10:

### Smart Home Security and Privacy Survey

#### Security and Privacy Concerns and Actions

Which of the following actions have you taken on your home network (e.g., your home Wi-Fi)? (Select all that apply.)

- ☐ Set a Wi-Fi password
- ☐ Used [WPA2/3](#) encryption for my Wi-Fi
- ☐ Used a virtual private network (VPN)
- ☐ Set up my home network so that my smart home devices are separated from other devices on the network (i.e., network segmentation, subnetworking)
- ☐ Filter/control access to my home network (e.g., using a firewall or router)
- ☐ Implemented security best practices (e.g., updating, enabling authentication) for my smart phone or other devices I use to access my smart home device apps
- ☐ Other privacy or security related actions, please specify:
- ☐ I don't do any of these
- ☐ I don't know or am not sure - I am not the person in my household who takes these actions.

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### Question 11:

Items selected in Questions 9 and 10 will be used to populate this question. This question will be skipped if respondents select “I haven’t done any of these” or “I don’t know or am not sure” for both Questions 9 and 10.

## Smart Home Security and Privacy Survey

### Security and Privacy Concerns and Actions

For each of the actions you have taken, please rate your agreement with the following statement:

This action decreases my security and privacy concerns for my virtual voice assistants and smart speakers.

|                                                                                                                                                               | Strongly Disagree     | Disagree              | Neutral               | Agree                 | Strongly Agree        |
|---------------------------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Set a password or PIN on my smart home device/app                                                                                                             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Used two-factor or biometric authentication (e.g., password plus verification code, face recognition, fingerprint authentication) on my smart home device/app | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Been careful about not placing my smart home devices in more sensitive or private areas of my home                                                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Been careful about what I do/say when near my smart home devices                                                                                              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Set up or changed specific security/privacy settings on my smart home devices                                                                                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Set a Wi-Fi password                                                                                                                                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Used WPA2/3 encryption for my Wi-Fi                                                                                                                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Used a virtual private network (VPN)                                                                                                                          | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Set up my home network so that my smart home devices are separated from other devices on the network (i.e., network segmentation, subnetting)                 | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Filter/control access to my home network (e.g., using a firewall or router)                                                                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Implemented security best practices (e.g., updating, enabling authentication) for my smart phone or other devices I use to access my smart home device apps   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question 12:

Smart Home Security and Privacy Survey

Security and Privacy Concerns and Actions

For each of the following statements related to your virtual voice assistants and smart speakers, please rate your agreement:

|                                                                   | Strongly Disagree     | Disagree              | Neutral               | Agree                 | Strongly Agree        |
|-------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| It is easy to secure my smart home device.                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| It is easy to protect my privacy when using my smart home device. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Question 13:**

**Smart Home Security and Privacy Survey**

**Security and Privacy Concerns and Actions**

What keeps you from taking any actions, or more actions than you already take, to ease your security concerns for your virtual voice assistants and smart speakers? (Select all that apply.)

- ☐ I do not understand smart home security enough to know what I should do
- ☐ I do not understand the smart home device enough to know what I should do to secure my device
- ☐ The smart home device or device manufacturer does not provide enough options for setting my security preferences
- ☐ I do not know if the device or device manufacturer provides any options for setting my security preferences
- ☐ I would like to take actions/more action, but it is not a high priority for me at this time
- ☐ Other, please specify:
- ☐ Nothing prevents me—I am not concerned about the security of my smart home devices
- ☐ Nothing prevents me—I have taken action and am satisfied with what I have already done to secure my devices

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**Question 14:**

**Smart Home Security and Privacy Survey**

**Security and Privacy Concerns and Actions**

What keeps you from taking any actions, or more actions than you already take, to ease your privacy concerns for your virtual voice assistants and smart speakers? (Select all that apply.)

- ☐ I do not understand smart home privacy (including data collection and use) enough to know what I should do
- ☐ I do not understand the smart home device enough to know what I should do to protect my privacy
- ☐ The smart home device or device manufacturer does not provide enough options for setting my privacy preferences
- ☐ I do not know if the device or device manufacturer provides any options for setting my privacy preferences
- ☐ I would like to take actions/more action, but it is not a high priority for me at this time
- ☐ Other, please specify:
- ☐ Nothing prevents me—I am not concerned about the privacy of my smart home devices
- ☐ Nothing prevents me—I have taken action and am satisfied with what I have already done to protect my privacy

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**Question 15:**

**Smart Home Security and Privacy Survey**

**Security and Privacy Concerns and Actions**

Which of the following would you like to do for your virtual voice assistants and smart speakers but are currently not doing? (Select all that apply.)

- ☐ Keep smart home data from leaving my home network
- ☐ Turn on two-factor or biometric authentication (e.g., password plus verification code, face recognition, fingerprint authentication) for the smart home device app
- ☐ Opt in or opt out of certain data collection and usage practices
- ☐ Other:
- ☐ There's nothing additional I'd like to do.

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## Question 16:

### Smart Home Security and Privacy Survey

#### Responsibility

Please indicate your agreement with the following statements about your virtual voice assistants and smart speakers:

|                                                                                                                    | Strongly Disagree     | Disagree              | Neutral               | Agree                 | Strongly Agree        |
|--------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I think that the manufacturers currently provide me with enough options to set my own <u>security</u> preferences. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I think the manufacturers currently provide me with enough options to set my own <u>privacy</u> preferences.       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have to take action on my own to secure my smart home devices.                                                   | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I have to take action on my own to protect my privacy when using my smart home devices.                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question 17:

Smart Home Security and Privacy Survey

Responsibility

How responsible are you *currently* for the following aspects of your virtual voice assistants and smart speakers?

|          | Not at all Responsible | Slightly Responsible  | Somewhat Responsible  | Mostly Responsible    | Completely Responsible |
|----------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|
| Security | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |
| Privacy  | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |

**Question 18:**

**Smart Home Security and Privacy Survey**

**Responsibility**

How responsible *should* you be for the following aspects of your virtual voice assistants and smart speakers?

|          | Not at all Responsible | Slightly Responsible  | Somewhat Responsible  | Mostly Responsible    | Completely Responsible |
|----------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|
| Security | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |
| Privacy  | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |

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**Question 19:**

**Smart Home Security and Privacy Survey**

**Responsibility**

How responsible are device manufacturers *currently* for the following aspects of your virtual voice assistants and smart speakers?

|          | Not at all Responsible | Slightly Responsible  | Somewhat Responsible  | Mostly Responsible    | Completely Responsible |
|----------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|
| Security | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |
| Privacy  | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |

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Question 20:

Smart Home Security and Privacy Survey

Responsibility

How responsible *should* device manufacturers be for the following aspects of your virtual voice assistants and smart speakers?

|          | Not at all<br>Responsible | Slightly<br>Responsible | Somewhat<br>Responsible | Mostly<br>Responsible | Completely<br>Responsible |
|----------|---------------------------|-------------------------|-------------------------|-----------------------|---------------------------|
| Security | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>     |
| Privacy  | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>     |

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**Question 21:**

**Smart Home Security and Privacy Survey**

**Responsibility**

How responsible is the government *currently* for the following aspects of your virtual voice assistants and smart speakers?

|          | Not at all<br>Responsible | Slightly<br>Responsible | Somewhat<br>Responsible | Mostly<br>Responsible | Completely<br>Responsible |
|----------|---------------------------|-------------------------|-------------------------|-----------------------|---------------------------|
| Security | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>     |
| Privacy  | <input type="radio"/>     | <input type="radio"/>   | <input type="radio"/>   | <input type="radio"/> | <input type="radio"/>     |

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Question 22:

Smart Home Security and Privacy Survey

Responsibility

How responsible *should* the government be for the following aspects of your virtual voice assistants and smart speakers?

|          | Not at all Responsible | Slightly Responsible  | Somewhat Responsible  | Mostly Responsible    | Completely Responsible |
|----------|------------------------|-----------------------|-----------------------|-----------------------|------------------------|
| Security | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |
| Privacy  | <input type="radio"/>  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/>  |

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**Question 23:**

**Smart Home Security and Privacy Survey**

**Responsibility**

If someone were to hack (gain unauthorized access) into your virtual voice assistants and smart speakers smart home device or data, how much would you blame each of the following?

|                                   | Not Blame at All      | Slightly Blame        | Somewhat Blame        | Mostly Blame          | Completely Blame      |
|-----------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Myself or other household members | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Device manufacturers              | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Government                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question 24:

Smart Home Security and Privacy Survey

Responsibility

Rate your agreement with the following statements:

|                                                                                          | Strongly Disagree     | Disagree              | Neutral               | Agree                 | Strongly Agree        |
|------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| I feel able to protect my smart home device's security.                                  | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I feel able to protect my privacy when using my smart home device.                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am willing to put in the effort to protect my privacy when using my smart home device. | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| I am willing to put in the effort to secure my smart home device.                        | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

**Question 25:**

**Smart Home Security and Privacy Survey**

**Security & Privacy Information Sources**

How do you *currently* learn about the security and privacy features of your virtual voice assistants and smart speakers? (Select all that apply.)

- ☐ Manufacturer's website
- ☐ Online retailer website product description (e.g., Amazon or Best Buy websites)
- ☐ Online forums discussing smart home devices (e.g., Reddit)
- ☐ Social media
- ☐ Family or friends
- ☐ News articles/stories
- ☐ Product package
- ☐ Device privacy policy or user level agreement
- ☐ Information included on an in-store retail outlet's product shelf label or display
- ☐ Security vulnerability databases/repositories
- ☐ My workplace
- ☐ Internet service provider
- ☐ Videos, webinars, or other online training
- ☐ Other, please specify:
- ☐ I don't currently seek out security and privacy information about my devices

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**Question 26:**

**Smart Home Security and Privacy Survey**

**Security & Privacy Information Sources**

In what ways *would you like to* learn about the security and privacy features of your virtual voice assistants and smart speakers in the future? (Select all that apply.)

- ☐ Manufacturer's website
- ☐ Online retailer website
- ☐ Online forums discussing smart home devices (e.g., Reddit)
- ☐ Social media
- ☐ Family or friends
- ☐ News articles/stories
- ☐ Product package
- ☐ Device privacy policy or user level agreement
- ☐ Information included on an in-store retail outlet's product shelf label or display
- ☐ Security vulnerability databases/repositories
- ☐ My workplace
- ☐ Internet service provider
- ☐ Videos, webinars, or other online training
- ☐ Other, please specify:
- ☐ I'm not interested in learning more about the security and privacy features of my devices

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Question 27:

Smart Home Security and Privacy Survey

Security & Privacy Information Sources

How likely are you to use the following information to inform your future purchases of virtual voice assistants and smart speakers?

|                                                                                               | Very Unlikely         | Unlikely              | Neutral               | Likely                | Very Likely           |
|-----------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Information on the security and privacy risks of my smart home device                         | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Information on the device manufacturer's data practices, including collection and use of data | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Information on what <u>security</u> features and options are included in my device            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Information on what <u>privacy</u> features and options are included in my device             | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Information on whether the product has met some kind of minimum security or privacy standards | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question 28:

Smart Home Security and Privacy Survey

Security & Privacy Information Sources

How likely would you be to act on the following information for your virtual voice assistants and smart speakers?

|                                                                                                                                          | Very Unlikely         | Unlikely              | Neutral               | Likely                | Very Likely           |
|------------------------------------------------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| Recommendations on how to better <u>secure my smart home device</u> (e.g., by configuring device security options)                       | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Recommendations on how to better <u>secure my home network</u>                                                                           | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Recommendations on how to better protect my <u>privacy</u> when using my smart home device (e.g., by configuring device privacy options) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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Question 29:

Smart Home Security and Privacy Survey

Security & Privacy Information Sources

How trusting would you be of a security and privacy rating or label for your virtual voice assistants and smart speakers if provided by the following?

|                                                                                                    | Very Distrusting      | Distrusting           | Neutral               | Trusting              | Very Trusting         |
|----------------------------------------------------------------------------------------------------|-----------------------|-----------------------|-----------------------|-----------------------|-----------------------|
| U.S. Government                                                                                    | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Device manufacturer                                                                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| Not-for-profit organization that performs independent product evaluations (e.g., Consumer Reports) | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A for-profit organization that does independent product evaluations                                | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |
| A smart home device retailer (e.g., Best Buy or Amazon)                                            | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> | <input type="radio"/> |

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**Question 30:**

**Smart Home Security and Privacy Survey**

**Security & Privacy Information Sources**

How long have you been using smart home devices?

- ☐ Less than one year
- ☐ 1 to 2 years
- ☐ 3 to 5 years
- ☐ 6 or more years
- ☐ Prefer not to answer

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**Question 31:**

**Smart Home Security and Privacy Survey**

**Security & Privacy Information Sources**

How would you best describe your role with respect to your smart home devices?

- ☐ I am an administrator of smart home devices in my household - I installed the devices or I am the one who configures the devices or troubleshoots when something goes wrong.
- ☐ I am an active user of the smart home devices but not an administrator
- ☐ Other, please specify:

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## Question 32:

### Smart Home Security and Privacy Survey

In which state or US territory do you live? You may skip this question.

Select an answer...

Select an answer...

- Alabama
- Alaska
- America Samoa
- Arizona
- Arkansas
- California
- Colorado
- Connecticut
- Delaware
- District of Columbia
- Florida
- Georgia
- Guam
- Hawaii
- Idaho
- Illinois
- Indiana
- Iowa
- Kansas

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### Smart Home Security and Privacy Survey

In which state or US territory do you live? You may skip this question.

Select an answer...

Select an answer...

- Kentucky
- Louisiana
- Maine
- Maryland
- Massachusetts
- Michigan
- Minnesota
- Mississippi
- Missouri
- Montana
- Nebraska
- Nevada
- New Hampshire
- New Jersey
- New Mexico
- New York
- North Carolina
- North Dakota
- Northern Mariana Islands
- Ohio

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### Smart Home Security and Privacy Survey

In which state or US territory do you live? You may skip this question.

Select an answer...

Select an answer...

- North Dakota
- Northern Mariana Islands
- Ohio
- Oklahoma
- Oregon
- Pennsylvania
- Puerto Rico
- Rhode Island
- South Carolina
- South Dakota
- Tennessee
- Texas
- US Virgin Islands
- Utah
- Vermont
- Virginia
- Washington
- West Virginia
- Wisconsin
- Wyoming

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**Question 33:**

**Smart Home Security and Privacy Survey**

Do you own or rent your home?

- ☐ Own
- ☐ Rent
- ☐ Other:
- ☐ Prefer not to answer

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**Question 34:**

**Smart Home Security and Privacy Survey**

In which type of area is your home?

- ☐ Rural
- ☐ Suburban
- ☐ Urban
- ☐ Prefer not to answer

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**Question 35:**

**Smart Home Security and Privacy Survey**

What is your age range? You may skip this question.

- ☐ 18 to 24
- ☐ 25 to 34
- ☐ 35 to 44
- ☐ 45 to 54
- ☐ 55 to 64
- ☐ 65 or older
- ☐ Prefer not to answer

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**Question 36:**

**Smart Home Security and Privacy Survey**

What is your gender?

- ☐ Male
- ☐ Female

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**Question 37:**

**Smart Home Security and Privacy Survey**

What is your ethnicity? You may skip this question.

- ☐ Hispanic or Latino
- ☐ Not Hispanic or Latino

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**Question 38:**

**Smart Home Security and Privacy Survey**

What is your race? (Select one or more). You may skip this question.

- ☐ American Indian or Alaska Native
- ☐ Asian
- ☐ Black or African American
- ☐ Native Hawaiian or Other Pacific Islander
- ☐ White

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**Question 39:**

**Smart Home Security and Privacy Survey**

What is your highest level of education?

- ☐ Less than high school degree
- ☐ High school degree or equivalent
- ☐ Some college
- ☐ Associate degree
- ☐ Bachelor's degree
- ☐ Graduate degree (e.g., Master's, PhD, MD, or Juris Doctoral)
- ☐ Other, please specify:
- ☐ Prefer not to answer

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**Question 40:**

**Smart Home Security and Privacy Survey**

Which of the following best describes your current employment status?

- ☐ Employed full-time
- ☐ Employed part-time
- ☐ Full-time student, currently not employed
- ☐ Retired, currently not employed
- ☐ Currently not employed

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**Question 41:**

**Smart Home Security and Privacy Survey**

Have you ever received a degree in or worked in a field/job related to computers, information technology (IT), cybersecurity, or privacy?

*Degree examples: Computer Science, Computer Engineering, Information Technology, Cybersecurity, Data and Privacy Law*

*Job examples: System administrator, network engineer, IT help desk, cybersecurity policy, software developer, privacy engineer*

- ☐ No
- ☐ Yes

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**Question 42:**

**Smart Home Security and Privacy Survey**

What was your total household income before taxes during the past 12 months? (Do not include income of dependents or unrelated household members). You may skip this question.

- ☐ Less than \$25,000
- ☐ \$25,000 to \$34,999
- ☐ \$35,000 to \$49,999
- ☐ \$50,000 to \$74,999
- ☐ \$75,000 to \$99,999
- ☐ \$100,000 to \$149,999
- ☐ \$150,000 to \$199,999
- ☐ \$200,000 to \$299,999
- ☐ \$300,000 to \$399,999
- ☐ \$400,000 and above
- ☐ Prefer not to answer

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Submit

Thank you for completing the NIST Smart Home Security and Privacy Survey. Your results are saved and you may now exit the survey.