Feeling Insecure?  What the IoT Community Needs to Know to Navigate the Evolving Legal and Regulatory Landscape Requiring “Reasonable Security” Features for IoT and Connected Devices

IEEE IoT Vertical and Topical Summit at RWW2021
January 13, 2021

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Agenda

- IoT and Connected Devices Technology Use Cases
- Legal and Regulatory Framework Surrounding IoT and Connected Devices Technologies
IoT Devices and Data Generated and Transmitted

Massive growth in the number of IoT devices deployed and in use, coupled with use of AI-enabled technologies (AIoT), presents new/complex challenges from legal and regulatory perspective.

Vast amounts of data, including personal data, being generated, collected, transmitted, stored, and processed creates major challenges from the standpoint of security, privacy, and data protection.

Regulators, policymakers, and the public at large have taken notice of IoT devices and AI-enabled technologies.

Source: https://www.gsma.com/iot/resources/the-gsma-iot-infographic
Rise in the Number of High Profile Data Breaches

Increasing lack of trust – collection, use, protection of data

Concerns regarding security vulnerabilities, automated-decision making, limited user interface, integration into IS and infrastructure

Driving increased focus - policymakers/govt, public and private sector businesses, individuals/society-at-large

Source: https://www.informationisbeautiful.net/visualizations/worlds-biggest-data-breaches-hacks/
IoT and Connected Devices Technology
Use Cases
Internet of Things (IoT) & Connected Devices – Use Cases

• “Internet of Things devices are devices that--

(A) have at least one transducer (sensor or actuator) for interacting directly with the physical world, have at least one network interface, and are not conventional Information Technology devices, such as smartphones and laptops, for which the identification and implementation of cybersecurity features is already well understood; and

(B) can function on their own and are not only able to function when acting as a component of another device, such as a processor

Internet of Things Cybersecurity Improvement Act of 2020 (Dec 2020)
Internet of Things (IoT) & Connected Devices – Use Cases

- “a cyber-physical ecosystem of interconnected sensors and actuators, which enable intelligent decision making”

- Smart Home Devices – Voice Controller, Security, Lighting, Thermostat, Appliances
- Smart Manufacturing and Logistics
- Smart Cities - IoT sensors
- Smart Wearables – Health & Fitness Trackers

- IoT devices
- IoT device management
- IoT device connectivity and networking
- IoT device security
Internet of Things (IoT) & Connected Devices – Use Cases

Figure 2: Connections Between IoT Device Manufacturers and Customers Around Cybersecurity
Legal and Regulatory Framework Surrounding IoT and Connected Devices Technologies
Privacy Considerations – “Reasonable” Security Features

Figure 3: Customer Cybersecurity Needs and Goals Reflected in and Informed by Many Applicable Regulations and Guidance Documents
Privacy Considerations – “Reasonable” Security Features

- Internet of Things Cybersecurity Improvement Act of 2020 (Dec 2020)
- National Institute of Standard and Technology (NIST)
  - Workshop Summary Report for “Building the Federal Profile for IoT Device Cybersecurity” Virtual Workshop (Jan 2021)
  - IoT Non-Technical Supporting Capability Core Baseline (DRAFT NISTR 8259B) (Dec 2020)
  - Creating a Profile Using the IoT Core Baseline and Non-Technical Baseline (DRAFT NIST 8259C) (Dec 2020)
  - Profile Using the IoT Core Baseline and Non-Technical Baseline for the Federal Government (Draft NISTIR 8259D) (Dec 2020)
  - Foundational Cybersecurity Activities for IoT Device Manufacturers (NISTIR 8259) (May 2020)
  - IoT Device Cybersecurity Capability Core Baseline (NISTIR 8259A) (May 2020)
Privacy Considerations – “Reasonable” Security Features

- California Senate Bill 327 – “Security of Connected Devices” (Effective Jan 2020)
- Oregon House Bill 2395 – “Relating to security measures required for devices that connect to the Internet” (Effective Jan 2020)
- Similar legislation currently under consideration in Illinois, Kentucky, Maryland, Massachusetts, New York, Rhode Island, Vermont, and Virginia
- Comprehensive State Privacy Laws (i.e., California (CCPA), Maine, Nevada)
- Industry groups (e.g., CTIA, GSMA, ISO) issuing guidelines and recommendations for best practices
- Companies self-regulating by agreeing to comply with guidelines and recommendations
Privacy Considerations – “Reasonable” Security Features

- Council of the EU Conclusions on the Cybersecurity of Connected Devices (Dec 2020)
- EU Cybersecurity Act (Jun 2019)
- European Union Agency for cybersecurity (ENISA) mandate (Jun 2019)
- European cybersecurity certification framework (Jun 2019)
- ENISA Good Practices for Security of IoT
- ENISA Good practices for IoT and Smart Infrastructures Tool
- ENISA Baseline Security Recommendations for IoT
- Comprehensive Privacy Laws (i.e., GDPR, ePrivacy Regulation)
Privacy Considerations – “Reasonable” Security Features

- UK Department for Digital, Culture, Media & Sport Policy paper - Proposals for regulating consumer smart product cyber security - call for views (Updated Oct 2020)

- UK Code of Practice for consumer IoT security (Published Oct 2018)

- Comprehensive Privacy Laws (i.e., UK GDPR)
Privacy and Data Protection
Privacy and Data Protection

• What is Information Privacy?
  • The “appropriate” use of personal information under the circumstances
  • An individual’s right to determine how his or her personally identifiable information is used
  • An individual’s right to control the collection, use, processing, storage, disclosure, sale, and retention/deletion of personal information; to notice, choice and consent, and access; and to limit that information from becoming publicly available

• What is Data Protection?
  • Handling, storing, and managing of personal information
  • Controls on the information (information security, information quality)
  • Information lifecycle (collection, use and retention, disclosure, destruction)
  • Management (management and administration, monitoring and enforcement)
Privacy and Data Protection

• What is *personally identifiable information (PII)*?
  
  • Information which can be used to distinguish or trace an individual's identity, such as their name, social security number, biometric records, etc. alone, or when combined with other personal or identifying information which is linked or linkable to a specific individual, such as date and place of birth, mother’s maiden name, etc.

• GDPR refers to “personal data”
  
  • any information relating to an identified or identifiable natural person (‘data subject’); an identifiable natural person is one who can be identified, directly or indirectly, in particular by reference to an identifier such as a name, an identification number, location data, an online identifier or to one or more factors specific to the physical, physiological, genetic, mental, economic, cultural or social identity of that natural person
Privacy and Data Protection

• CCPA refers to “Personal Information”
  • information that identifies, relates to, describes, is capable of being associated with or could reasonably be linked, directly or indirectly, with a particular Consumer or household, including (but not limited to):
    • Personal Identifiers (e.g., name, postal address, email address, online IP address, social security number);
    • Internet or other electronic network activity information; and
    • Employment, educational, and commercial information.
Privacy and Data Protection

- **Sensitive** personal information – subset of PI requiring additional privacy and security limitations
  - Passport No, Driver’s license No, SSN, Tax ID
  - Financial Info and medical records
  - Racial or ethnic origin; political opinions; religious or philosophical beliefs;
  - Genetic data; biometric data (where processed to uniquely identify someone).
- **Nonpersonal** information (data elements that identify individual removed)
  - Anonymized data or aggregated data
- **Pseudonymized** data (not fully anonymous)
  - Process that detaches the aspects of the information attributed to the specific individual (e.g., replace name of individual with artificial identifier -- a token)
Privacy and Data Protection

• Comprehensive/Omnibus Law
  • EU – General Data Protection Regulation (GDPR)
  • Brazil – General Data Privacy Law
  • India -- Personal Data Protection Bill
  • Japan - Act on the Protection of Personal Information (APPI)

• Sectoral/Industry-Specific Law
  • US – No single, comprehensive federal law regulating the collection and use of personal data – patchwork system of federal and state laws and regulations
    • Federal agencies that regulate privacy:
      • Federal Trade Commission (FTC)
      • Federal banking regulatory authorities
      • Federal Communications Comm (FCC)
      • Dept. of Commerce
      • Dept. of Transportation (DOT)
    • States – Attorneys General

• Co-regulatory – Few/No Laws
General Privacy Laws and Regulations - US

• California Consumer Privacy Act (CCPA)
  • Signed into law June 28, 2018 – Took effect Jan 2020

• Maine – Act to Protect the Privacy of Online Consumer Information
  • Signed into law June 6, 2019 – Took effect July 2020

• Nevada – Senate Bill 220 (SB 220) - Nevada Privacy of Information Collected on the Internet from Consumers Act (NPICICA)
  • Signed into law May 29, 2019 – Took effect Oct 2019

• IAPP State Comprehensive Privacy Law Comparison (2020-11-17)
General Privacy Laws and Regulations - US
IoT and Connected Devices
Specific Laws and Regulations
IoT & Connected Devices Specific Laws and Regulations - US

• **IoT Cybersecurity Improvement Act (Dec 2020)**
  
  • “To establish minimum security standards for Internet of Things devices owned or controlled by the Federal Government, and for other purposes.”
  
  • Requires the development, adoption and implementation of security standards for IoT devices by the federal government.
  
  • Requires security standards and guidelines to be published by the National Institute of Standards and Technology (NIST) by **March 4, 2021**
  
  • Directs NIST to ensure the consistency of its publication pursuant to the Act with its existing guidance regarding IoT vulnerabilities and considerations about how they should be managed, including in the domains of secure development, identity management, patching and configuration management.
  
  • NIST standards and guidelines will then be incorporated into federal government information security policies and principles as well as Federal Acquisition Regulations by **September 4, 2021**
IoT & Connected Devices Specific Laws and Regulations - US

• **IoT Cybersecurity Improvement Act (Dec 2020)**
  - Requires guidelines on IoT vulnerability information sharing and resolution for IoT devices owned or controlled by an agency to be published by NIST by **September 4, 2021**
  - Requires guidelines for government contractors providing IoT systems and any subcontractor thereof at any tier providing such information system to such contractor to be published by NIST by **September 4, 2021**
  - Subject to limited exceptions, government agencies are prohibited from buying or using IoT devices that do not comply with the NIST standards and guidelines
  - Act requires contractors providing IoT devices to the U.S. government to adopt coordinated vulnerability disclosure policies, so that if a vulnerability is uncovered, that information is disseminated
IoT & Connected Devices Specific Laws and Regulations - US

• National Institute of Standards and Technology (NIST)
  • Released draft guidance on IoT device cybersecurity - recommendations to federal agencies and manufacturers concerning effective cybersecurity (Dec 2020)
    • IoT Device Cybersecurity Guidance for the Federal Government: Establishing IoT Device Cybersecurity Requirements (DRAFT NISTSP 800-213)
    • IoT Non-Technical Supporting Capability Core Baseline (DRAFT NISTR 8259B)
    • Creating a Profile Using the IoT Core Baseline and Non-Technical Baseline (DRAFT NISTR 8259C)
    • Profile Using the IoT Core Baseline and Non-Technical Baseline for the Federal Government (Draft NISTIR 8259D)
  • Workshop Summary Report for “Building the Federal Profile for IoT Device Cybersecurity” Virtual Workshop (Jan 2021)
IoT & Connected Devices Specific Laws and Regulations - US

• National Institute of Standards and Technology (NIST)
  • Workshop Summary Report for “Building the Federal Profile for IoT Device Cybersecurity” Virtual Workshop (Jan 2021)
    • The mission of the NIST Cybersecurity for the Internet of Things (IoT) program is to cultivate trust in the IoT and foster an environment that enables innovation on a global scale through standards, guidance, and related tools. The Cybersecurity for IoT program supports the development and application of standards, guidelines, and related tools to improve the cybersecurity of connected devices and the environments in which they are deployed. By collaborating with stakeholders across government, industry, international bodies, and academia, the program aims to cultivate trust and foster an environment that enables innovation on a global scale.
IoT & Connected Devices Specific Laws and Regulations - US

• National Institute of Standards and Technology (NIST)
  • Core Baseline - list of six recommended security features that manufacturers can build into IoT devices, and that consumers can look for on a device’s box or online description while shopping:
    • **Device Identification**: The IoT device should have a way to identify itself, such as a serial number and/or a unique address used when connecting to networks
    • **Device Configuration**: Similarly, an authorized user should be able to change the device’s software and firmware configuration. For example, many IoT devices have a way to change their functionality or manage security features
    • **Data Protection**: It should be clear how the IoT device protects the data that it stores and sends over the network from unauthorized access and modification. For example, some devices use encryption to obscure the data held on the internal storage of the device
IoT & Connected Devices Specific Laws and Regulations - US

• National Institute of Standards and Technology (NIST)
  • Core Baseline - list of six recommended security features that manufacturers can build into IoT devices, and that consumers can look for on a device’s box or online description while shopping:
    • Logical Access to Interfaces: The device should limit access to its local and network interfaces. For example, the IoT device and its supporting software should gather and authenticate the identity of users attempting to access the device, such as through a username and password
    • Software and Firmware Update: A device’s software and firmware should be updatable using a secure and configurable mechanism. For example, some IoT devices receive automatic updates from the manufacturer, requiring little to no work from the user
    • Cybersecurity Event Logging: IoT devices should log cybersecurity events and make the logs accessible to the owner or manufacturer. These logs can help users and developers identify vulnerabilities in devices to secure or fix them
IoT & Connected Devices Specific Laws and Regulations - US

• Internet of Things and Connected Devices
  • California Senate Bill 327 – “Security of Connected Devices” (Effective Jan 2020)
  • Oregon House Bill 2395 – “Relating to security measures required for devices that connect to the Internet” (Effective Jan 2020)
  • Illinois, Kentucky, Maryland, Massachusetts, New York, Rhode Island, Vermont, and Virginia currently considering similar legislation
United States – CA Senate Bill 327 “Security of Connected Devices”

• Specifies the security obligations of “manufacturers” of “connected devices”
  • “manufacturers” means “the person who manufactures, or contracts with another person to manufacture on the person’s behalf, connected devices that are sold or offered for sale in California.”

  • “connected device” means “any device, or other physical object that is capable of connecting to the Internet, directly or indirectly, and that is assigned an Internet Protocol address or Bluetooth address.”
United States – CA Senate Bill 327 “Security of Connected Devices”

• Covered manufacturers must equip the connected device with a **reasonable security feature or features** that are all of the following:
  
  • (1) Appropriate to the nature and function of the device.
  
  • (2) Appropriate to the information it may collect, contain, or transmit.
  
  • (3) Designed to protect the device and any information contained therein from unauthorized access, destruction, use, modification, or disclosure.
If a connected device is equipped with a means for authentication outside a local area network, it shall be deemed a reasonable security feature under subdivision (a) if either of the following requirements are met:

• (1) The preprogrammed password is unique to each device manufactured.
• (2) The device contains a security feature that requires a user to generate a new means of authentication before access is granted to the device for the first time.
United States – OR House Bill 2395 “Relating to security measures required for devices that connect to the internet”

• Similar to California’s Security of Connected Devices law, including the same reasonable security features language

• Narrower definition of “connected device” as a device or other physical object that:
  • (A) Connects to the Internet and is used primarily for personal, family or household purposes; and
  • (B) Is assigned an Internet Protocol address or another address or number that identifies the connected device for the purpose of making a short-range wireless connection to another device.
### EU – Baseline Security Recommendations for IoT & Connected Devices

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<td>Vulnerability management</td>
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<td>Definition of the procedure to document, monitor and track all changes that may be made in the software development process.</td>
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<td>Incident management</td>
<td>Procedure to address the steps to be taken in order to ensure a normal operation when a security issue takes place in the SDLC process.</td>
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<td>Management of the end of</td>
<td>Secure management process of software components, artefacts and data once the IoT solution is going to be retired from production.</td>
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<td>Delivery management to push new versions of software in a remote environment securely when it is necessary to apply an update, either to add new functionalities or to mitigate vulnerabilities.</td>
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</table>
EU – Baseline Security Recommendations for IoT & Connected Devices

**PEOPLE**
- Training and Awareness
- Roles and Privileges
- Security Culture

**GOOD PRACTICES**

**TECHNOLOGIES**
- Access Control
- Third-Party Software
- Secure Communication
- Secure Code

**TECHNOLOGIES**
- Security Reviews
- Security of SDLC Infrastructure
- Secure Implementation

**PROCESSES**
- Third-Party Management
- Operations Management
- SDLC Methodology
- Secure Deployment
- Security Design
- Internal Policies
Best Practices – Building a Compliance Program and Framework for Risk Management
Best Practices/Framework for Risk Management - IoT & Connected Devices

- **Review the regulatory landscape**: Monitor IoT regulatory developments worldwide, including laws, industry standards, guidelines and enforcement cases.

- **Develop IoT review framework**: Create a cross-functional data review board to get input from various stakeholders and demonstrate to regulators a thoughtful decision-making process.

- **Initiate a security assessment**: Run an assessment to identify whether a new IoT product implicates any regulatory security requirements and incorporates appropriate security safeguards.

- **Privacy by Design**: Engage with product team early and stay involved during the development lifecycle.

- **Continuous Compliance Monitoring**
Compliance Strategy & Framework for Risk Management

- Develop and implement a compliance strategy and framework for risk management to establish best practices for legal/regulatory (e.g., GDPR, CCPA, etc.) compliance.
Establish Governance Structure

- Company defines, documents, communicates, and assigns **accountability** for its privacy policies and procedures

- Assign Ownership – establish ownership of risk for privacy program – buy-in from C-Suite/Level Execs

- Establish Steering Committee – include reps from bus units most heavily impacted by privacy obligations

- Define Roles and Decision-making – Define roles of privacy professionals (CPO, CISO, DPO)
Personal Data Inventory, Retention, & Transfer

• **Key foundational step** in establishing privacy compliance strategy and developing program is understanding what data (PI) is being managed

Best practice to create “data map” for understanding PI collected and tracking flow (i.e., collection→use→processing→storage→sale→deletion)

Document processes/procedures, incl sources of PI and how collected, location(s)
PI stored, how PI used by bus, what PI retained, deleted, and transferred to TP

Implement and maintain reasonable data security practices and take appropriate measures for each point on the data map and understand potential vulnerabilities
Data Privacy Policies & Notices

• Company needs to develop privacy notices applicable to each type of data subject and internal privacy policies for the organization

  Develop privacy notices or review existing ones to ensure/verify they meet each requirement of applicable privacy laws/regs (e.g., GDPR, CCPA, APPI)

  Develop internal privacy policies that establish accountability, roles, and responsibilities (e.g., Enterprise-wide, Legal, Employee)

  Review and update existing privacy notices (at least every 12 mo and as necessary) to conform with any changes to legal/reg reqts and bus practices
Individual Rights/Consumer Preference Management

- Organization needs to be prepared to manage requests from individuals to provide the type of PI collected, sold, or disclosed, to provide a copy of the PI, and to maintain and honor consent preferences

  - Required to make available at least 2 (VCR) submission options (e.g., through website, by toll-free telephone)
  - Develop ID verification process to ensure PI being provided to correct person
  - Develop standard data retrieval procedures, reporting formats, and tracking systems, and ensure PI transferred in secure manner
  - Establish and maintain program to support consumer rights and preferences related to their PI (e.g., consent, opt-in, opt-out, forgotten)
Vendor/Third Party Management

• Critical for organization to understand where PI is being shared with vendors, service providers, and other third parties, and establish oversight.

  - Conduct detailed assessment to determine what PI is being shared with vendors, service providers, & other TPs.
  - Track and document any disclosure of PI to a vendor, service provider, or other TP.
  - Ensure written contract with vendor, service provider, or other TP limiting use of PI to conform with legal/regulatory requirements.
Training & Awareness Program

- **Everyone who handles PI**, including decisionmakers, should receive training in organization’s privacy programs and policies.

  - Documenting training and awareness program, providing training materials, maintaining records of training, providing scripts for cust svc reps
  - Organization will need to provide different training for different groups within organization and consider specific training based on types of PI handled
  - Training and awareness is an ongoing process and key to successful privacy program deployment and sustainability
Data Privacy Breach Management Program

- Company defines an organized approach to managing the occurrence and aftermath of a data privacy incident, security breach, or cyberattack

  - Prepare IT & staff to handle potential incidents
  - Process to identify whether incident is “data breach”
  - Process for ensuring no further threat and recovering affected systems
  - Process for finding cause, removing affected systems, and eradicating
  - Process for containment to limit damage and isolate affected systems
Continuous Compliance Monitoring

- Company defines a **compliance monitoring framework** to support current and new operational practices, address future laws, and demonstrate ongoing compliance

  - Establish periodic reviews of compliance strategy and framework for risk management, updating data inventory/mapping, notices and policies
  - Seek to enhance framework and program by utilizing more automation, governance, risk & compliance (GRC) software/tools
  - Monitor compliance and incidents, revise policies and procedures as needed, and adapt based on new and changing laws/regulations
Thank you!

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MARTIN M. ZOLTICK

- Technology lawyer with more than 30 years of experience, with degree in Computer Science and experience working as a software engineer
- Practice is focused primarily on intellectual property (IP) matters, transactions, and privacy, data protection, and cybersecurity
- Certified Information Privacy Professional in the United States (CIPP/US)
- Regularly counsels clients on understanding and navigating rapidly evolving area of privacy and data protection law
- Working with clients to prepare, integrate, and implement best practices for CCPA, other state’s laws, and GDPR compliance
- Providing thought leadership on the application of data protection laws and industry/technology-specific data privacy and security considerations for IoT devices, biometric data, and in outer space

AREAS OF CONCENTRATION
- Counseling
- Privacy, Data Protection, and Cybersecurity
- Licensing and Transactions
- Litigation
- Patent Prosecution (Registered US PTO)
- Post-Grant Trial Practice

EDUCATION
- J.D., Catholic University of America, Columbus School of Law – 1989
- B.S., Computer Science, Northeastern University, College of Computer Science – 1985 (cum laude) Cybersecurity