

Internet of Things (IoT): A Primer for Law Enforcement

The IoT Ecosystem



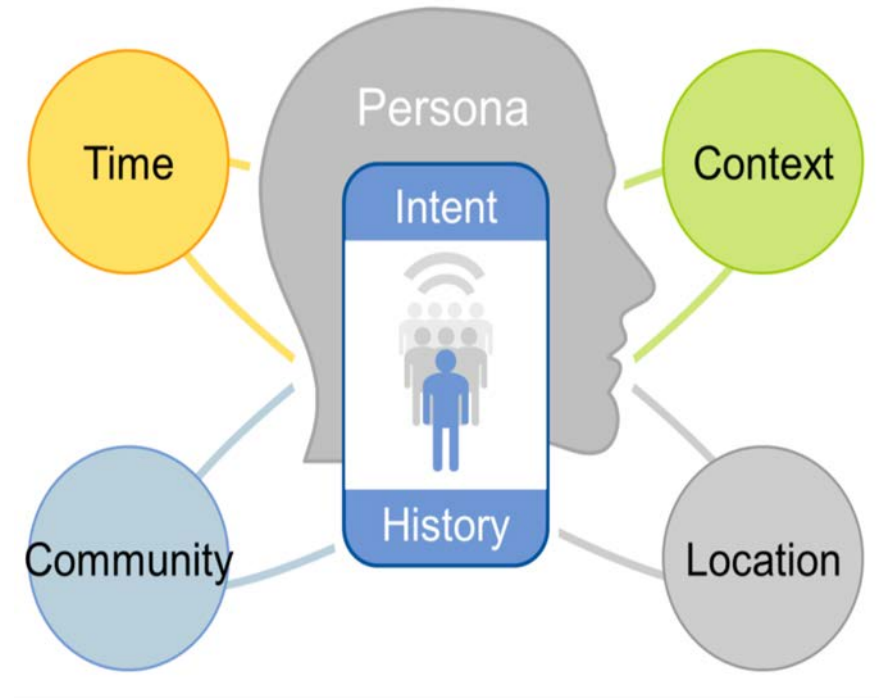
- The Internet of Things
- A network that connects uniquely identifiable things to the internet

Characteristics of IoT

- **Internet** refers to the large category of applications and protocols within the network
- **Things** refers to every object capable of connecting to the internet, including smart devices, sensors, and any other entity that is able to communicate with other connected objects
 - The interconnected things have physical and virtual representation in the digital world
 - sensing and actuating capability
 - programmability features
 - uniquely identifiable

Characteristics of IoT

- Collectively, the IoT ecosystems contain information including the thing identity, status, location or any other relative information
- Relationships and context....



Characteristics of IoT

- IoT technology is designed to establish relationships:
- from people to people
- people to things
- things to things

Data as a Commodity: Retail Sector

The Retail Sector of IoT Technology includes:

- Networking systems
- Devices that allow retailers to have increased visibility into the supply chain
- Devices that gather consumer and product information
- Devices that track assets and security, Point of Sale equipment, parking meters



The IoT Market

IoT Consumer Market

- producing smart appliances
- home-automation devices
- personal devices
- Online Services and application
- Amazon
- Apple
- Google
- Microsoft

Online Services Providers

- Amazon
- Apple
- Google
- Microsoft

Functionality

IoT Devices/ Hardware

- Data Collection
- Remote Collection
- Real-time monitoring

IoT Software

- Data Storage
- Data Processing
- Data Transferring
- Data Analysis
- Data Connection

VIZIO: Case Study

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What can be Collected on Smart TV

- Smart TV
- Cable Providers
- Smart Peripherals
- Applications
- Device IDs/ IP Address
- Voice /Camera
- Other nearby devices
- TV viewing data
 - Demographic targeting
- Data Minimization Efforts
 - De-identification
/aggregation techniques

Complaint For Permanent Injunction and Other Equitable and Monetary Relief

Vizio earned revenue via three distinct contracts:

- 1) **Audience Measurement** - what viewers watch and how they watch it (commercial, programs, channels viewed)
- 2) **Analyzing Advertising Effectiveness** - analyze a household's behavior across devices (a) whether a consumer visited a website following an advertisement or (b) vice-versa
- 3) **Targeting Advertising to Particular Consumer** - on their other digital devices based on viewing data.
 - Data aggregation: re-identification (name, sex, age, income, marital status, education, household value)

Stipulated Order For Permanent Injunction and Monetary Judgment

- Order
 - Vizio must pay \$2.2Million – State and Federal Plaintiffs
- Prohibited Misleading Representations
 - Must not misrepresent (express nor by implication)
- Notice and Affirmation Express Consent Provision
 - Obtain affirmative consent, visual, audible disclosure, dictation/syntax
 - languages
- Data Deletion
 - Must destroy viewing data
- Mandated Privacy Program
 - Establish, implement and maintain a comprehensive privacy program (risk assessment, training, controls)
- Privacy Assessments by a Third Party
 - Obtain initial and biennial assessments of Program

Challenges

- IoT architecture can be unique for each application
- Global reach and coordination
- Raises a legal and human rights issue.

