

Privacy

INTRODUCTION TO DATA PRIVACY



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Security and Privacy Instructor

Privacy's origin story

- 1800s conversations about technology and Privacy:
 - Individuals' rights
 - Sensationalist reporting
- **Privacy** - The right to be left alone, or freedom from interference or intrusion.



¹ Samuel D. Warren and Louis D. Brandeis, "The Right to Privacy," Harvard Law Review, 4 (5), (1890): 193-220, p. 195, citing Judge Cooley in Cooley on Torts, 2nd ed.

Digging into today's definition of Privacy

- *Data Privacy* - control over how personal data is collected and used.
- "The authorized and valid processing of personal information."



¹ Bhajaria, Nishant, and Neil Hunt. Data Privacy: A Runbook for Engineers. Manning Publications Co., 2022.

Personal data

- ***Personal data*** - data related to a person or can be used to identify an individual.
 - Examples:
 - Date of birth (DOB)
 - Name
 - Geolocation
- Goal to keep personal data safe

Individual questions

1 What is your name? (Person 1 on page 3)

First name

Last name

2 What is your sex?

☐ Male ☐ Female

3 What is your date of birth?

Day Month Year

2011, what is your legal marital or partnership status?

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Privacy's expanding implications

- Increase discussions in 21st-century due to:
 - Internet
 - Applications
 - Larger data footprint
- Privacy concerns include:
 - Surveillance
 - Big data analytics
 - 3rd party providers




State of Privacy today

- 59%+ of Americans do not know what is being done with their data.
- 81% of Americans say that the risks of collecting data about them outweigh the benefits.
- Potential causes:
 - Lack of Privacy knowledge
 - Lack of trust
 - Lack of standardized regulation



Privacy Implications

Privacy has different implications for different groups

Personas 	Why Privacy Matters	Consequences
User	<ul style="list-style-type: none">• User Trust• Confidence	<ul style="list-style-type: none">• Violation of individual's rights• Increased risk of data misuse
Company	<ul style="list-style-type: none">• Compliance• Protecting Users	<ul style="list-style-type: none">• Financial loss• Legal repercussions
Regulator	<ul style="list-style-type: none">• Standardization• Protecting Users	<ul style="list-style-type: none">• Loss of public confidence• Exploitation of the public

PREACH

- **P (Purpose)** - Why is the company asking to use your data?
- **R (Right to Request)** - Do you have the ability to request changes to your information?
- **E (Easy to understand)** - Is it easy to understand a company's policies?
- **A (Alerting)** - Will you be alerted if the company mishandles your data?
- **C (Consent)** - Have you given consent (i.e., permission) for your information to be used?
- **H (How)** - How is the company or service planning to use your data?

Let's practice!

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Security

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Why are we talking about Security?

- Security is a precursor to Privacy.
- Security and Privacy programs are like an ice cream sundae:
 - Security = ice cream
 - Privacy = toppings



What is Information Security?

Information Security (InfoSec) - "The protection of information and information systems from unauthorized access, use, disclosure, disruption, modification, or destruction in order to provide confidentiality, integrity, and availability."



¹ <https://www.nist.gov/blogs/cybersecurity-insights/next-generation-security-and-privacy-controls-protecting-nations>

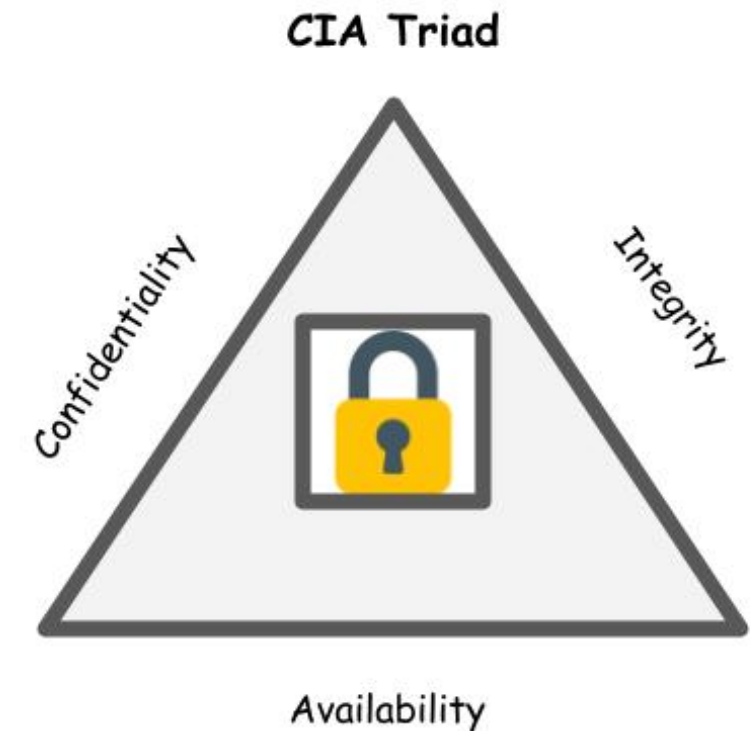
CIA Triad

- Popular security model
- ***CIA Triad*** helps companies identify and understand security controls
- **Note:** Many security models exist
 - Example - *DIE*
 - Distributed
 - Immutable
 - Ephemeral



CIA Triad breakdown

- CIA Triad represents:
 - **Confidentiality** - data is protected and not accessed by unauthorized parties.
 - **Integrity** - data is not altered or modified unexpectedly.
 - **Availability** - data systems are running as expected.



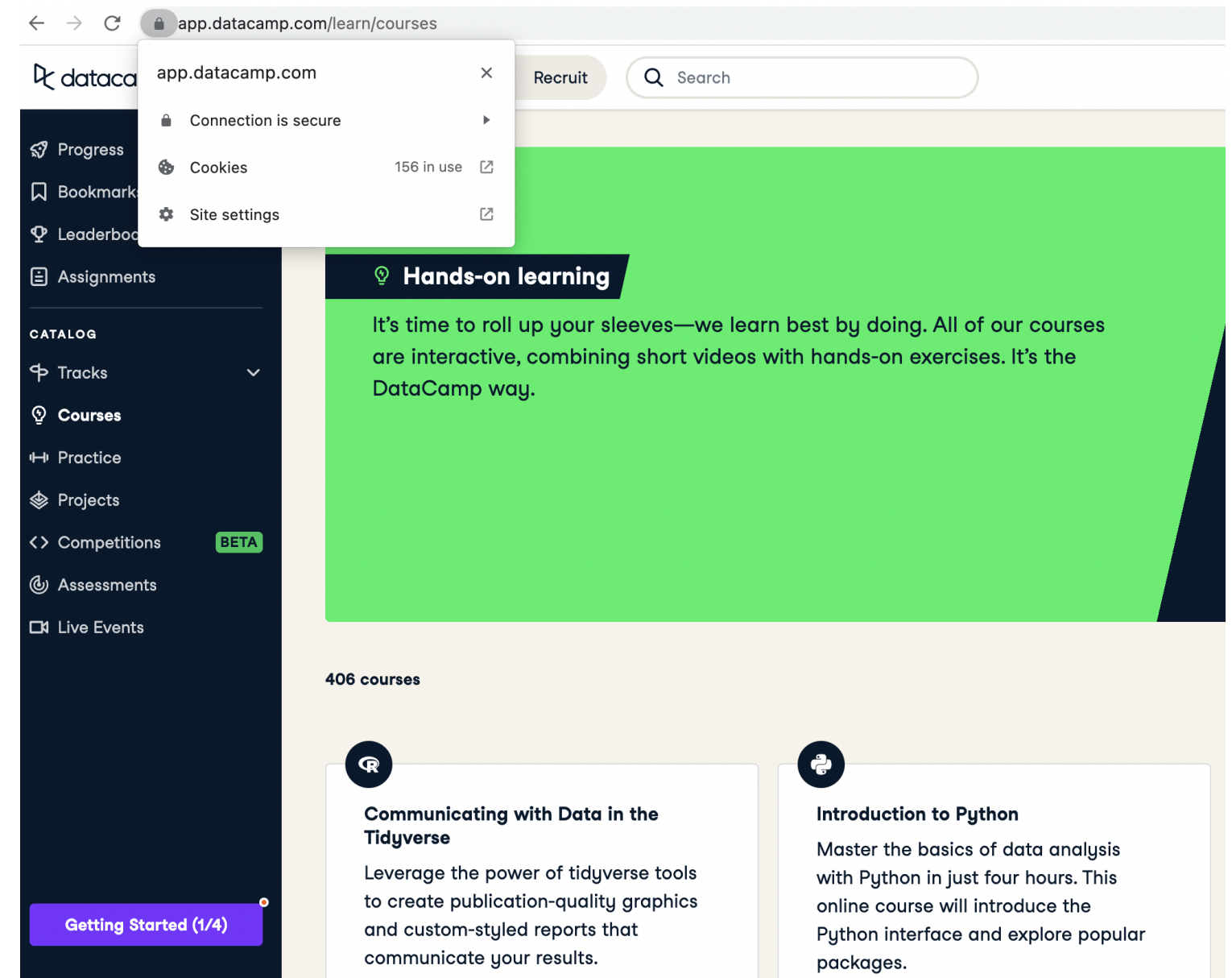
Confidentiality - Identity Access Management (IAM)

- **Confidentiality** system's ability to ensure that only correct users have access to information.
- **Identity Access Management (IAM)**
 - Ensures right people have access to the right resources at the right time.
- Real World Example - Limiting employee access to resources:
 - Company email address
 - Access to corporate network
 - Access during working hours - 8AM to 5PM



Integrity - encryption and hashing

- **Integrity** - data can be trusted and has not been inappropriately modified
 - **Encryption** - is a process that makes readable data undecipherable.
 - "midnight" -> "Y!lay.ig"
 - **Hashing**- converting data to a standardized algorithmic output
- Real World: HTTPS communications



Availability - Business Continuity and Disaster Recovery

- **Availability** systems are accessible and available.
- **Business Continuity and Disaster Recovery (BCDR)** the processes, policies, and people used to help an organization continue during an unplanned event.
- Example - Flood damages data center



Let's practice!

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The relationship between Security and Privacy

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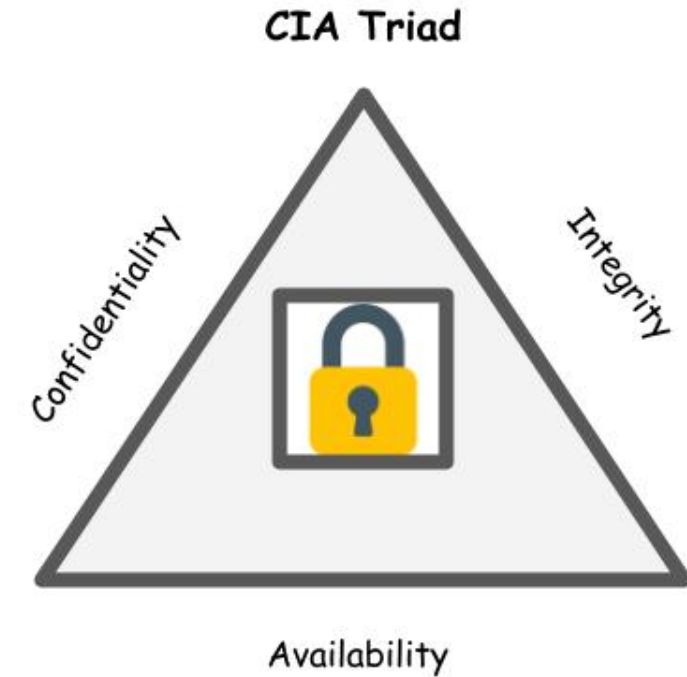


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Security fundamentals

- Preventing unauthorized use, disclosure, and alteration of data:
 - CIA Triad
- Examples:
 - Encryption
 - Identity Access Management

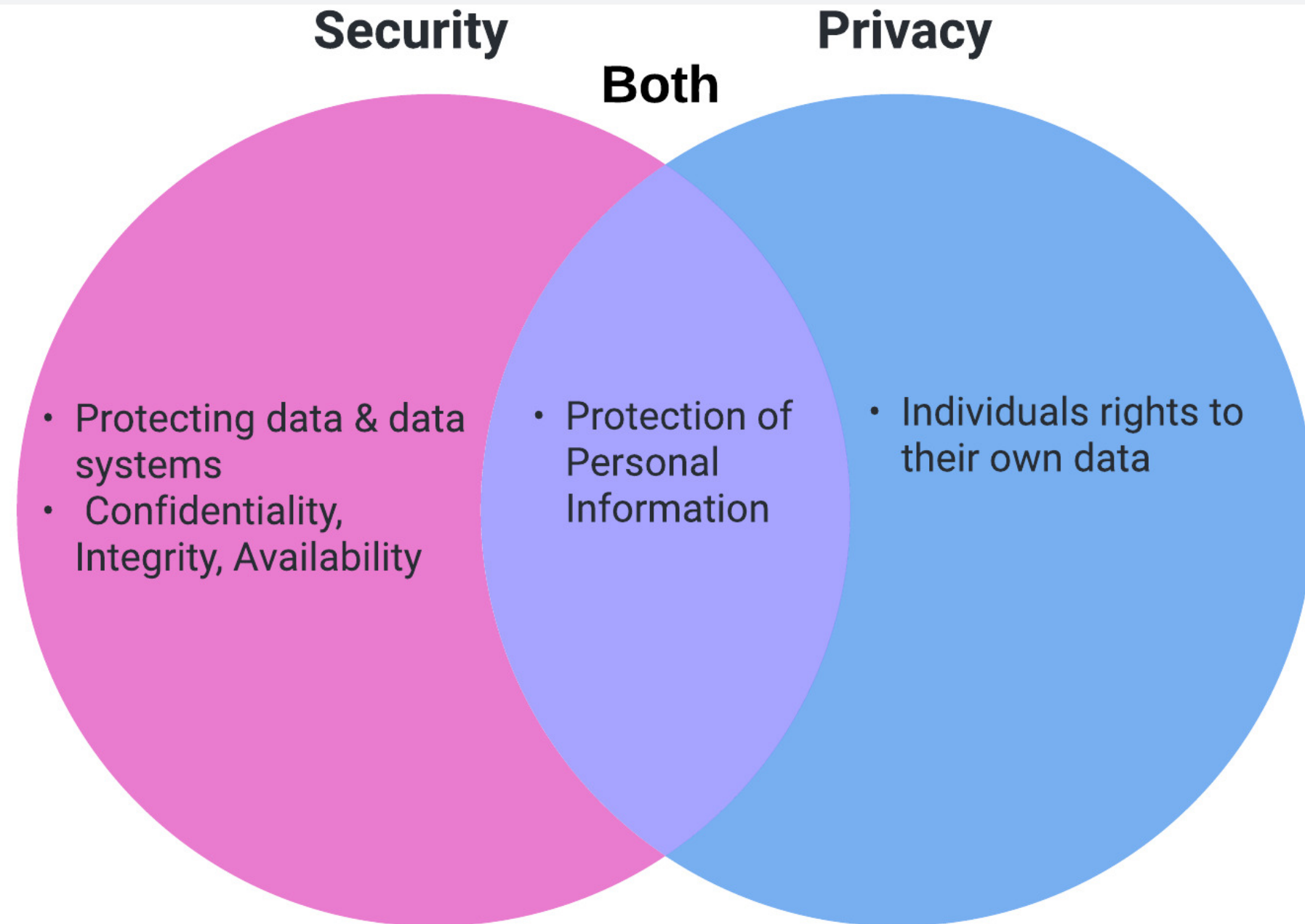


Privacy fundamentals

- Data processed in a valid manner that has been authorized by the user
- Examples:
 - Notifications
 - Encryption



Security and Privacy Venn diagram



Packing what we've learned

- Backpack startup
- Security and Privacy concerns
- Analyze:
 - Product data
 - Personal information



Security Controls

Security

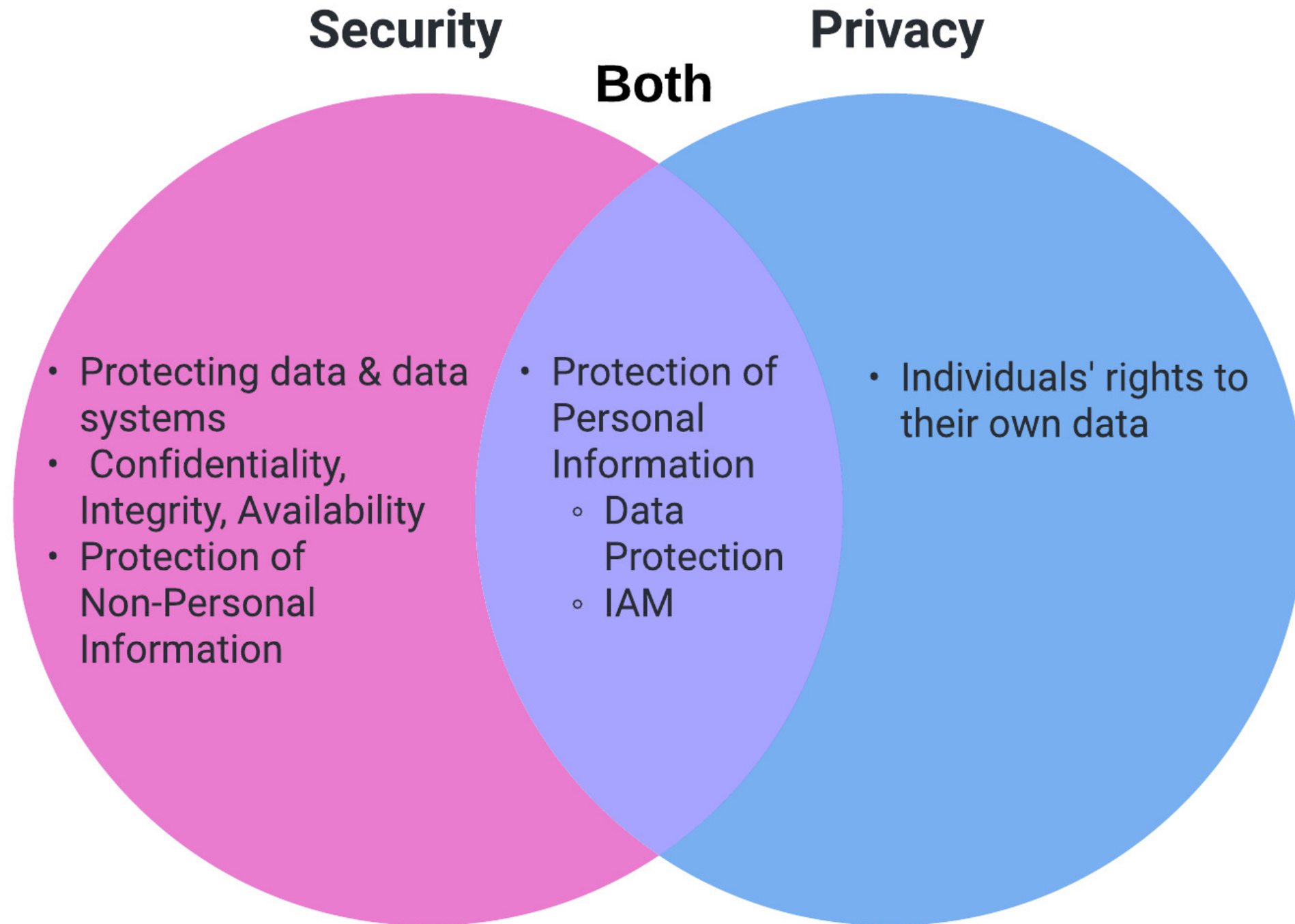
- Protecting data & data systems
- Confidentiality, Integrity, Availability
- Data Protection controls
- IAM controls
- Personal & Non-Personal Information

Privacy Controls

Privacy

- Individuals' rights to their own data
- IAM for Personal Information
- Data Protection for Personal Information

Security and Privacy Venn diagram



Security and Privacy failure

- Privacy requires explicit authorization from users to:
 - disclose
 - alter
 - change how data is used
- Stolen data - no consent or authorization from users



Data breach

Data Breach - a security event where data is unlawfully disclosed, altered, or taken by an unauthorized party.

- Example: Yahoo data breach in 2013
 - Effected over 3 billion users
 - Hackers attempted to sell the data



¹ <https://www.nytimes.com/2017/10/03/technology/yahoo-hack-3-billion-users.html>

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