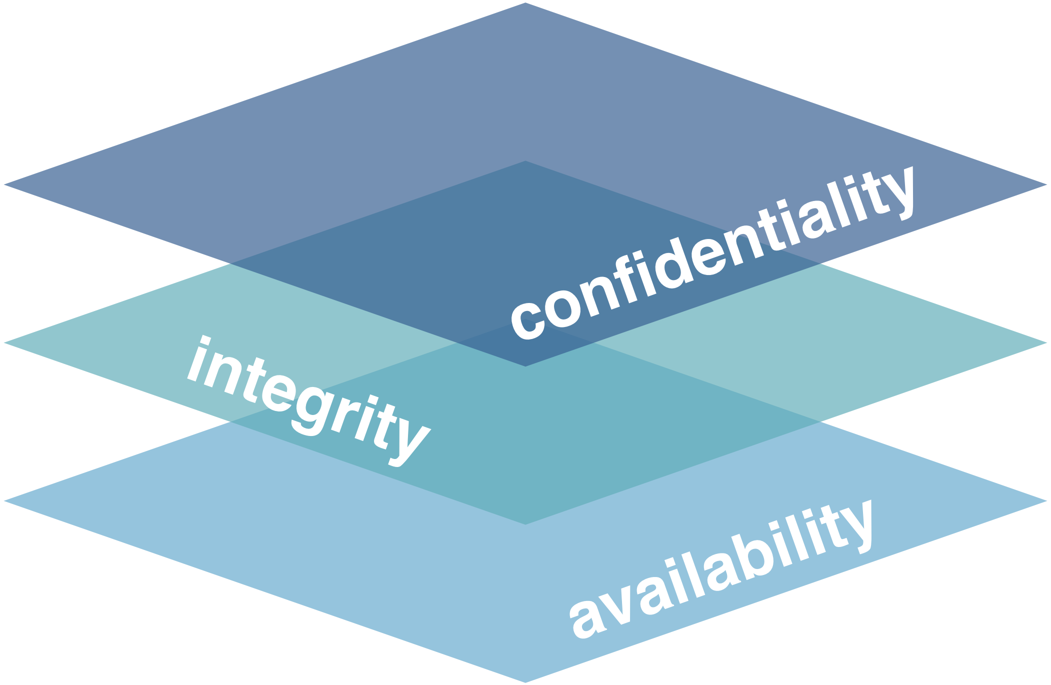
Cybersecurity Fundamentals

Cybersecurity Objectives

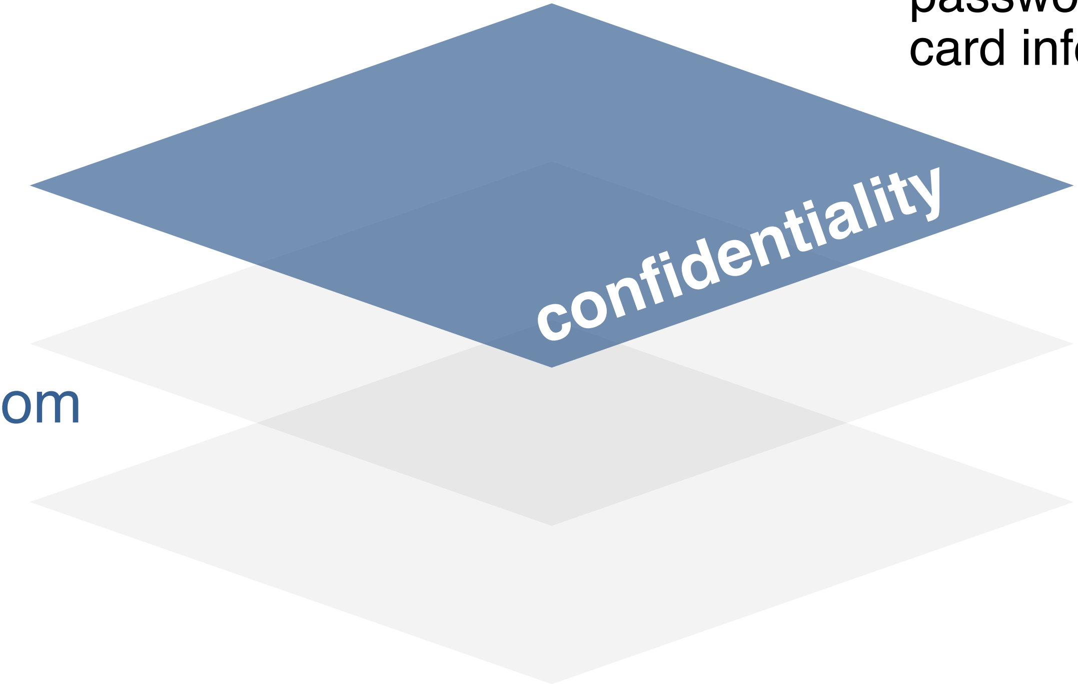


More
NIST Special Publication 800-12, revision 1
An Introduction to Information Security
section 1.4

Confidentiality

Example:

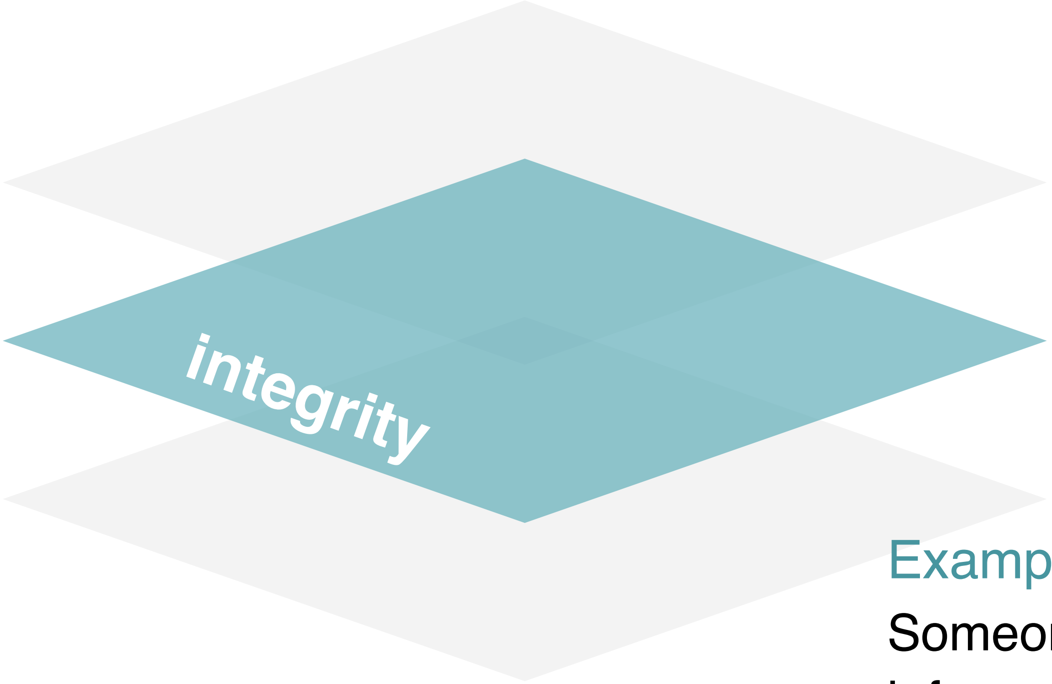
Criminal steals customers' usernames, passwords, or credit card information



Protecting information from unauthorized access and disclosure

Integrity

Protecting information from unauthorized modification



Example:

Someone alters payroll information or a proposed product design

Availability

Example:

Your customers are unable to access your online services

availability

Preventing disruption in how information is accessed

Elements of Risk

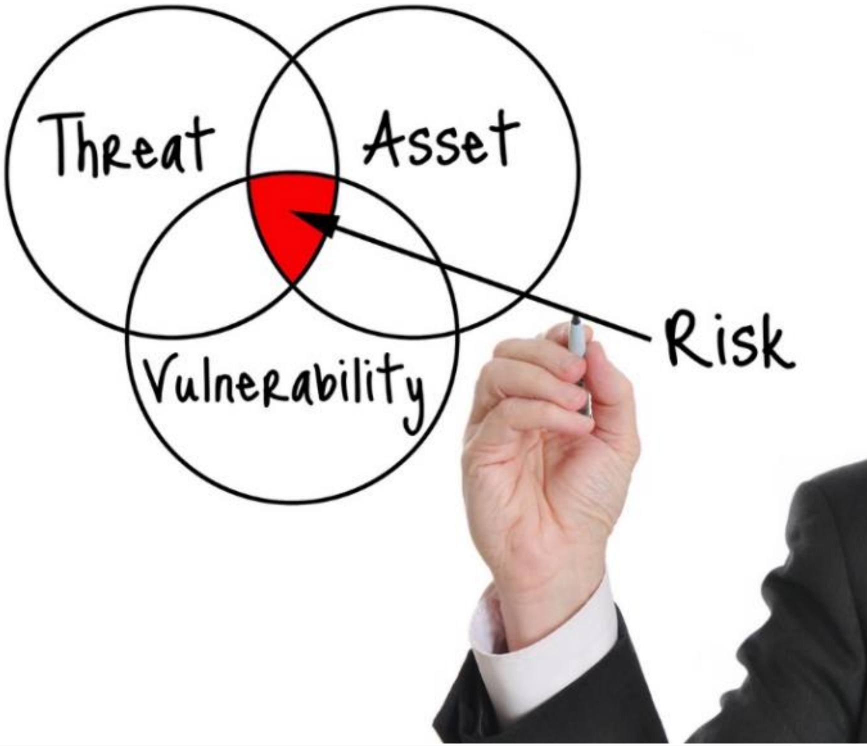
What are the **threats**?
What are the **vulnerabilities**?
What is the **likelihood** of a threat exploiting a vulnerability?
What would be the **impact** of this to your business?

> **More**
> NIST Special Publication 800-30, revision 1
> *Guide for Conducting Risk Assessments,* section 2.3.1

What are you protecting?

To practice cybersecurity risk management, you can start with these steps:

1. Identify your business' assets
2. Identify the value of these assets
3. Document the impact to your business of loss or damage to the assets
4. Identify likelihood of loss or harm
5. Prioritize your mitigation activities accordingly



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NIST Interagency Report 7621, revision 1
Small Business Information Security: The Fundamentals, section 2.2

1. Identify Your Business Assets

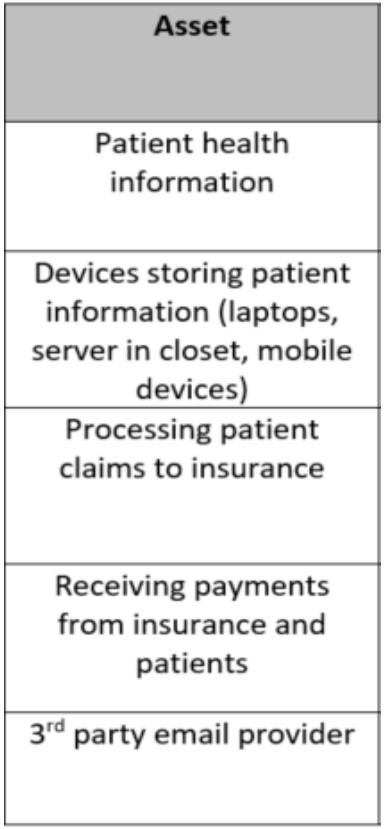
List the types of information, processes, important people and technology your business relies upon

- Customer info
- Key employees
- Banking info
- Manufacturing Process
- Proprietary technology

Also consider critical business processes like sales and budgeting.

1. Identify Your Business Assets on the Worksheet (cont.)

- In column 1 of the worksheet, list the assets (e.g., information, people, processes, or technology) that are most important to your business
- Add more rows, if needed



Asset
Patient health information
Devices storing patient information (laptops, server in closet, mobile devices)
Processing patient claims to insurance
Receiving payments from insurance and patients
3rd party email provider

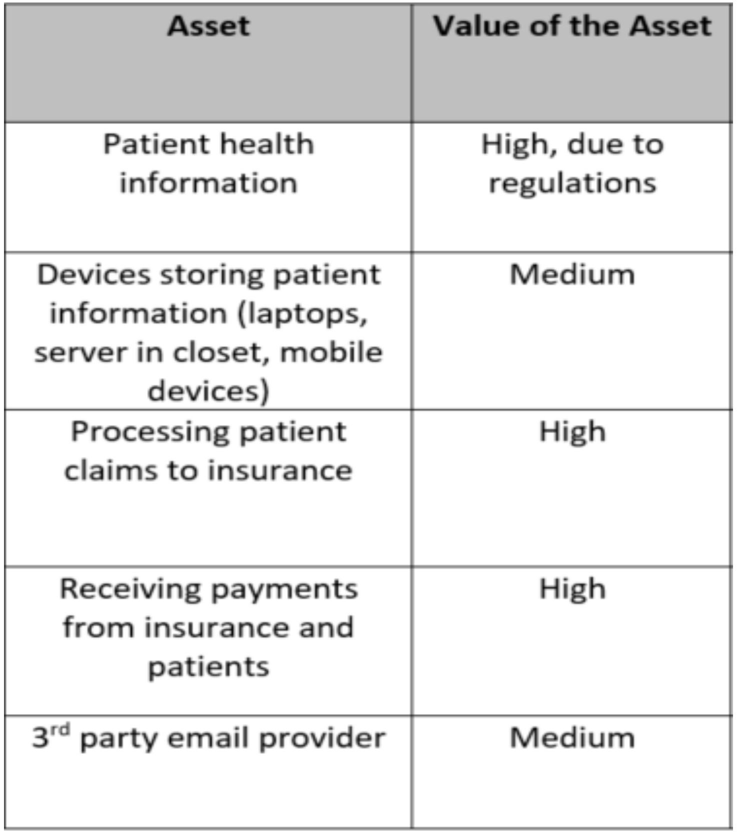
2. Identify the Value of the Assets

Go through each asset type you identified and ask these questions:

- What would happen to my business if this asset was made public?
- What would happen to my business if this asset was damaged or inaccurate?
- What would happen to my business if I/my customers couldn’t access this asset?

2. Identify the Asset Values on the Worksheet (cont.)

- Pick an asset value scale that works for you (e.g., low, medium, high or a numerical range like 1-5)



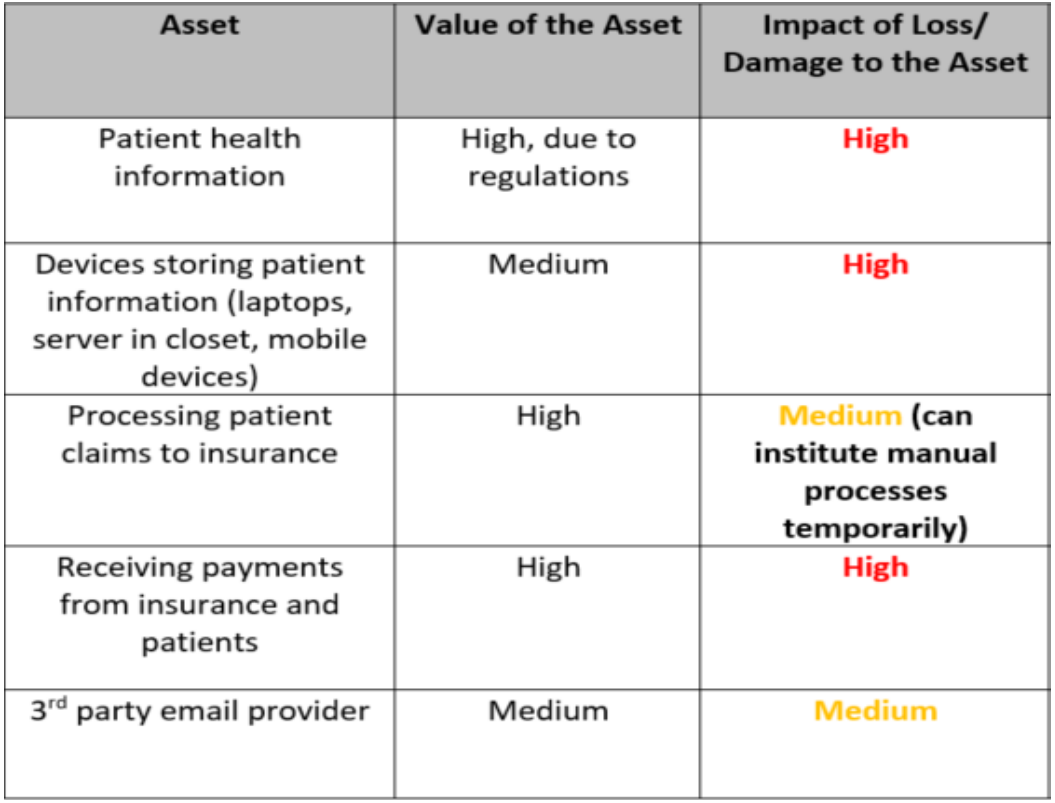
Asset	Value of the Asset
Patient health information	High, due to regulations
Devices storing patient information (laptops, server in closet, mobile devices)	Medium
Processing patient claims to insurance	High
Receiving payments from insurance and patients	High
3rd party email provider	Medium

3. Document the Impact to your Business of Loss/ Damage to the Assets

- Consider the impact to your business if each asset were lost, damaged, or reduced in value (e.g., intellectual property revealed to competitors)
- This impact may differ from the asset value determined in step 2.

3. Document the Impact to your Business of Loss/ Damage to the Assets (cont.)

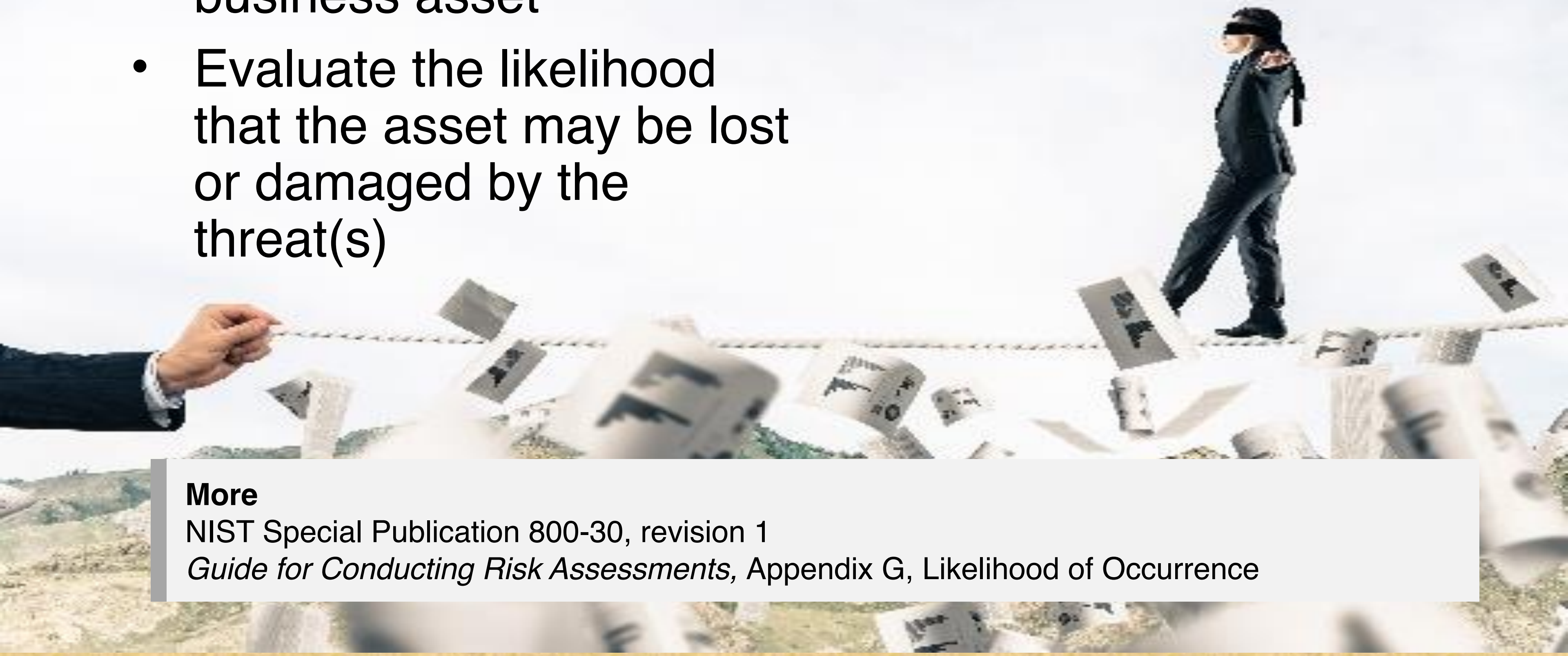
- Pick an impact value scale that works for you (e.g., low, medium, high)
- Consider if any business processes have manual backup methods



Asset	Value of the Asset	Impact of Loss/ Damage to the Asset
Patient health information	High, due to regulations	High
Devices storing patient information (laptops, server in closet, mobile devices)	Medium	High
Processing patient claims to insurance	High	Medium (can institute manual processes temporarily)
Receiving payments from insurance and patients	High	High
3rd party email provider	Medium	Medium

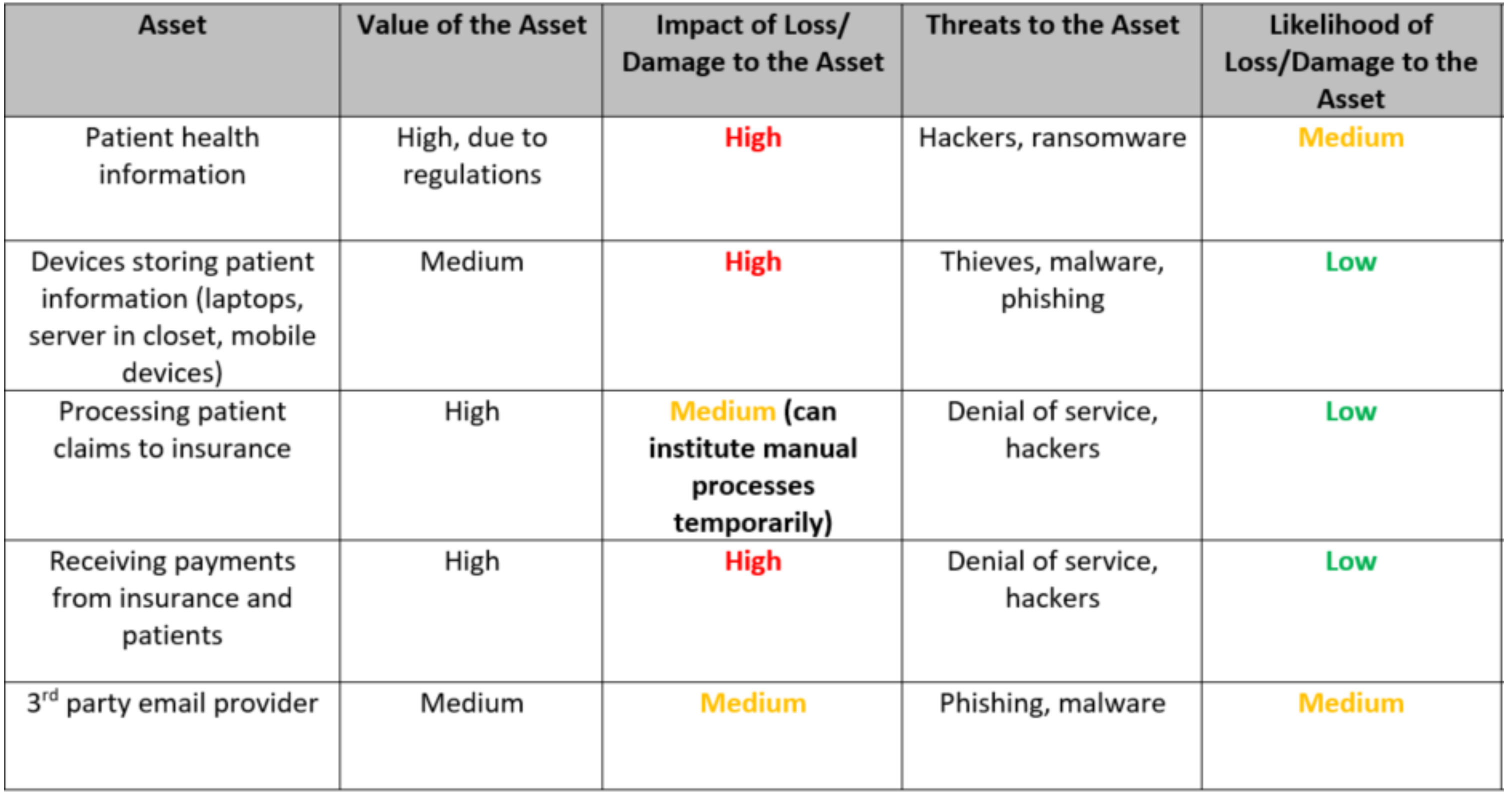
4. Identify likelihood of loss or damage to the asset

- List the threats to each business asset
- Evaluate the likelihood that the asset may be lost or damaged by the threat(s)



More
NIST Special Publication 800-30, revision 1
Guide for Conducting Risk Assessments, Appendix G, Likelihood of Occurrence

4. Identify likelihood of loss or damage to the asset (cont.)



Asset	Value of the Asset	Impact of Loss/ Damage to the Asset	Threats to the Asset	Likelihood of Loss/Damage to the Asset
Patient health information	High, due to regulations	**High**	Hackers, ransomware	**Medium**
Devices storing patient information (laptops, server in closet, mobile devices)	Medium	**High**	Thieves, malware, phishing	**Low**
Processing patient claims to insurance	High	**Medium (can institute manual processes temporarily)**	Denial of service, hackers	**Low**
Receiving payments from insurance and patients	High	**High**	Denial of service, hackers	**Low**
3rd party email provider	Medium	**Medium**	Phishing, malware	**Medium**

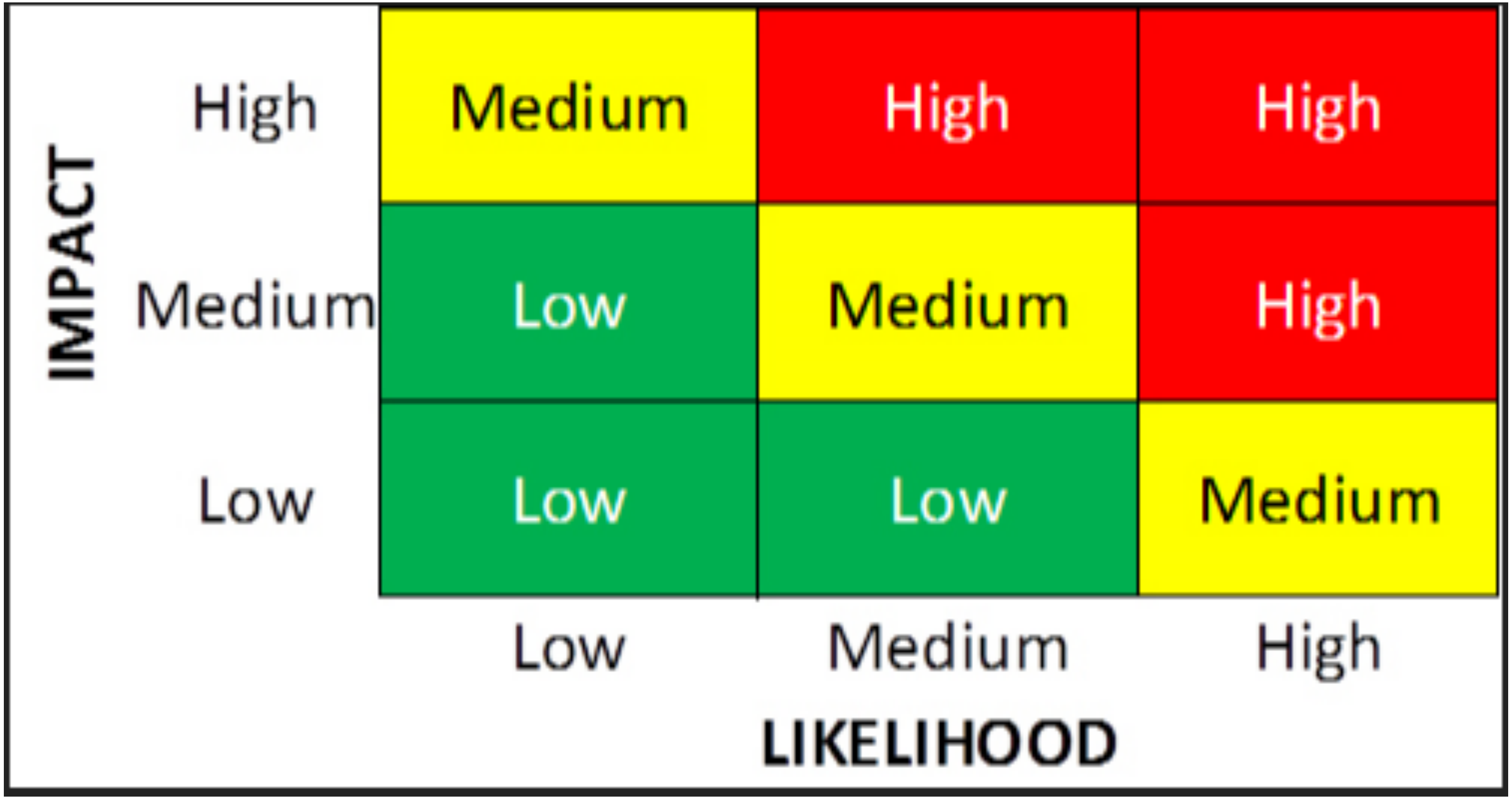
5. Identify Priorities and Potential Solutions

- Compare your impact and likelihood scores. Assets with high impact and/or likelihood scores should be assigned top priorities.
- Identify your priorities.
- Identify potential solutions.
- Develop a plan, including funding, to implement the solutions.

Sample Priority Structure

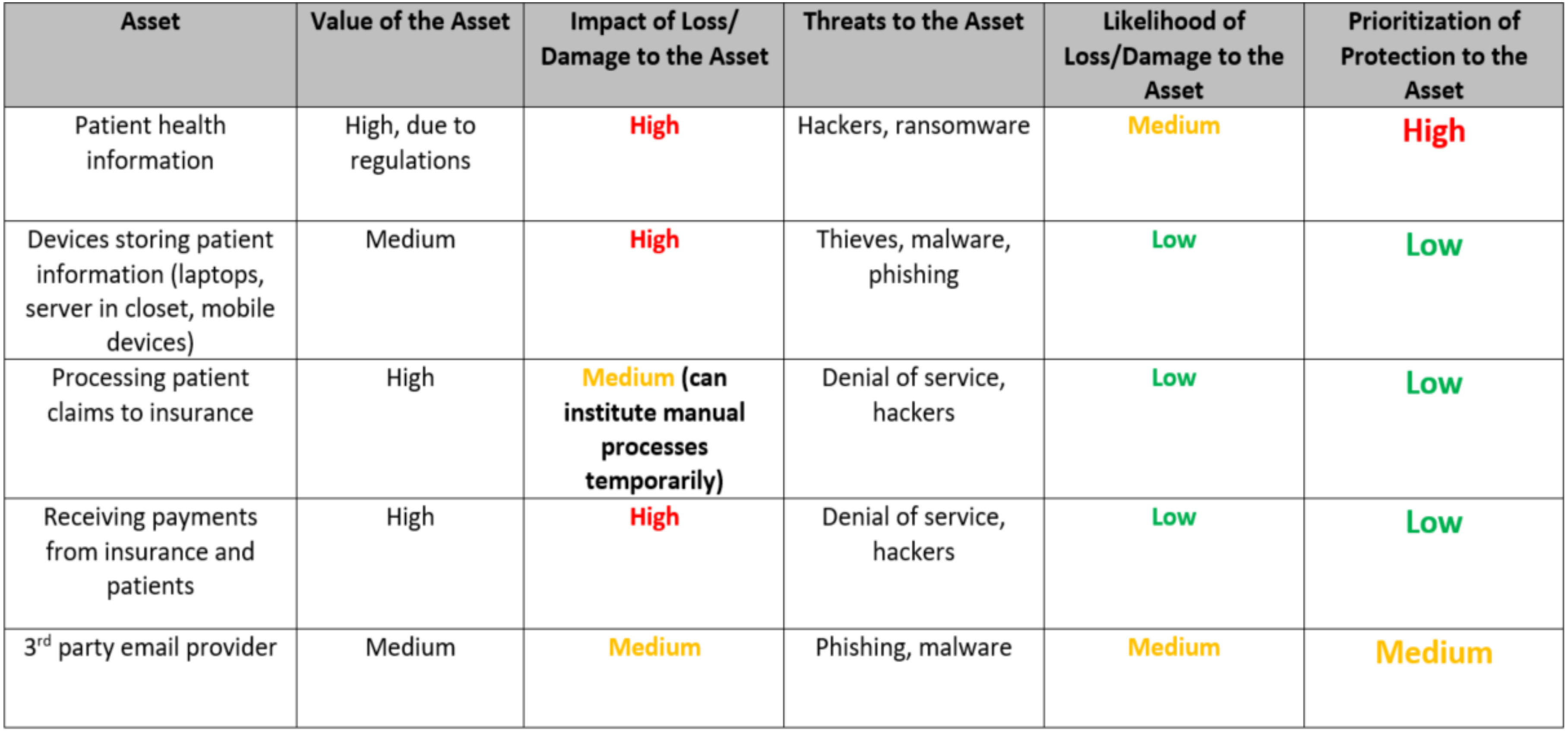
High: Implement immediate resolution.
Medium: Schedule a resolution.
Low: Schedule a resolution.

5. Prioritize Assets - Risk Matrix



IMPACT			
High	Medium	High	High
Medium	Low	Medium	High
Low	Low	Low	Medium
	Low	Medium	High
		LIKELIHOOD	

5. Prioritize Asset Protection



Asset	Value of the Asset	Impact of Loss/ Damage to the Asset	Threats to the Asset	Likelihood of Loss/Damage to the Asset	Prioritization of Protection to the Asset
Patient health information	High, due to regulations	High	Hackers, ransomware	Medium	High
Devices storing patient information (laptops, server in closet, mobile devices)	Medium	High	Thieves, malware, phishing	Low	Low
Processing patient claims to insurance	High	Medium **(can institute manual processes temporarily)**	Denial of service, hackers	Low	Low
Receiving payments from insurance and patients	High	High	Denial of service, hackers	Low	Low
3rd party email provider	Medium	Medium	Phishing, malware	Medium	Medium

NIST Cybersecurity Framework (“Framework for Improving Critical Infrastructure Cybersecurity ”)

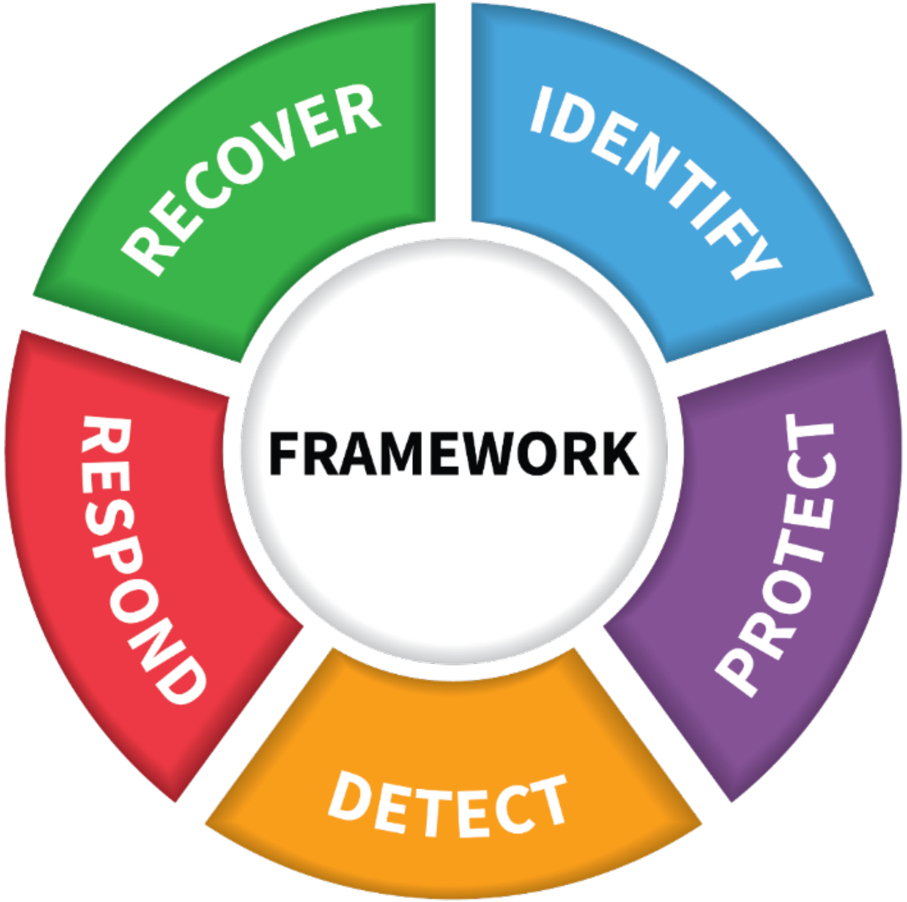
Provides a continuous process for cybersecurity risk management

For organizations of any size, in any sector, whether they have a cyber risk management program already or not

Has proven useful to a variety of audiences

More
Framework for Improving Critical Infrastructure Cybersecurity version 1.1

Cybersecurity Framework Functions



Credit: N. Hanacek/NIST

IDENTIFY
PROTECT
DETECT
RESPOND
RECOVER
FRAMEWORK

Identify

Develop organizational understanding to manage cybersecurity risk to systems, assets, data, and capabilities.

Sample Identify Activities

Business
Environment
[ID.BE]

Asset
Managemen
t
[ID.AM]

Governanc
e
[ID.GV]

Risk
Assessment
[ID.RA]

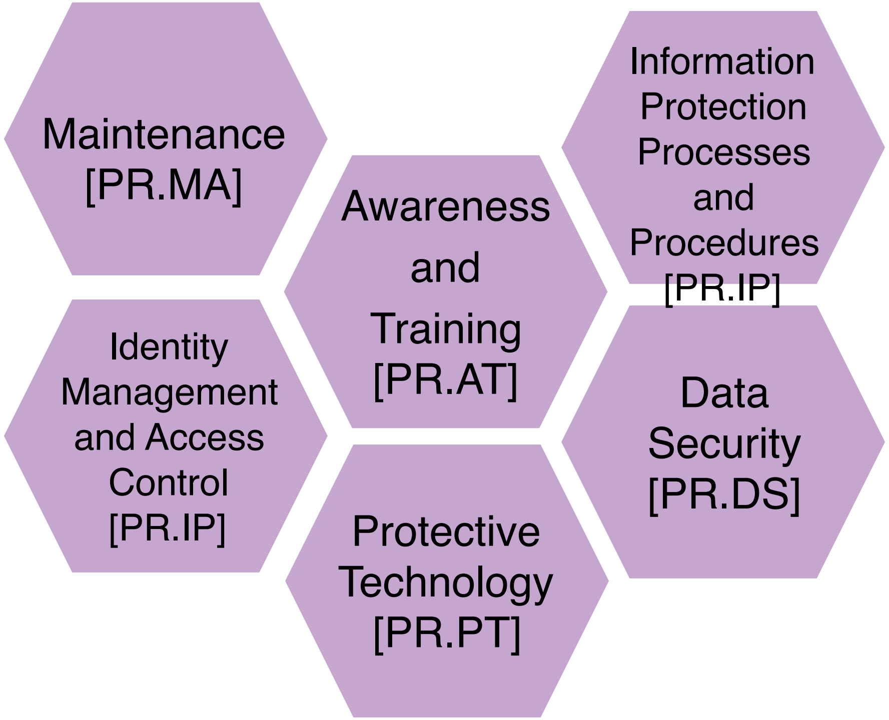
- Identify critical business processes
- Document Information flows
- Establish policies for cybersecurity that includes roles and responsibilities
- Maintain hardware and software inventory
- Identify contracts with external partners
- Identify Risk Management processes

FRAMEWORK
IDENTIFY
PROTECT
DETECT
RESPOND
RECOVER

Protect

Develop and implement the appropriate safeguards to ensure delivery of services.

Sample Protect Activities



Maintenance [PR.MA]

Identity Management and Access Control [PR.IP]

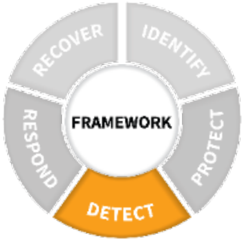
Awareness and Training [PR.AT]

Protective Technology [PR.PT]

Information Protection Processes and Procedures [PR.IP]

Data Security [PR.DS]

- Manage access to assets and information
- Conduct regular backups
- Protect sensitive data
- Patch operating systems and applications
- Create response and recovery plans
- Protect your network
- Train your employees



Detect

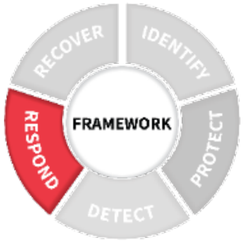
Develop and implement the appropriate activities to **identify the occurrence of a cybersecurity event.**

Sample Detect Activities

Anomalies and Events [DE.AE]

Continuous Monitoring [DE.CM]

- Install and update anti-virus and other malware detection software
- Know what are expected data flows for your business
- Maintain and monitor logs



Respond

Develop and implement the appropriate activities to **take action regarding a detected cybersecurity event.**

Sample Respond Activities

Response
Planning
[RS.RP]

Communication
s
[RS.CO]

- Coordinate with internal and external stakeholders
- Ensure response plans are tested
- Ensure response plans are updated

RECOVER
IDENTIFY
PROTECT
DETECT
RESPOND
FRAMEWORK

Recover

Develop and implement the appropriate activities to maintain plans for **resilience and to restore any capabilities or services** that were impaired due to a cybersecurity event.

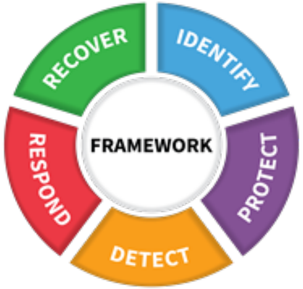
Sample Recover Activities

RECOVER
IDENTIFY
PROTECT
DETECT
RESPOND
FRAMEWORK

Recovery
Planning
[RC.RP]

Communication
s
[RC.CO]

- Manage public relations and company reputation
- Communicate with internal and external stakeholders
- Ensure recovery plans are updated
- Consider cyber insurance



Asset Management [ID.AM]

Risk Assessment [ID.RA]

Governance [ID.GV]

Business Environment [ID.BE]

Information Protection Processes and Procedures [PR.IP]

Identity Management and Access Control [PR.IP]

Protective Technology [PR.PT]

Maintenance [PR.MA]

Awareness and Training [PR.AT]

Data Security [PR.DS]

Anomalies and Events [DE.AE]

Continuous Monitoring [DE.CM]

Communications [RS.CO]

Response Planning [RS.RP]

Recovery Planning [RC.RP]

Communications [RC.CO]

Resources

NIST Small Business Cybersecurity Corner

https://www.nist.gov/itl/smallbusinesscyber

CyberSecure My Business I National Cyber Security Alliance

https://staysafeonline.org/cybersecure-business/

NIST Interagency Report 7621, revision 1 I *Small Business Information Security: The Fundamentals*

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More Information

https://www.nist.gov/itl/smallbusinesscyber

www.NIST.gov/topics/cybersecurity

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