



CONCEPTUAL CLARIFICATION OF CYBER-RISK ANALYSIS AND CYBERSECURITY

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- Cybersystem
- Cyberrisk management
- Cybersecurity
- Relationship between "cybersecurity" and other concepts of quality

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Cyber-Risk Management

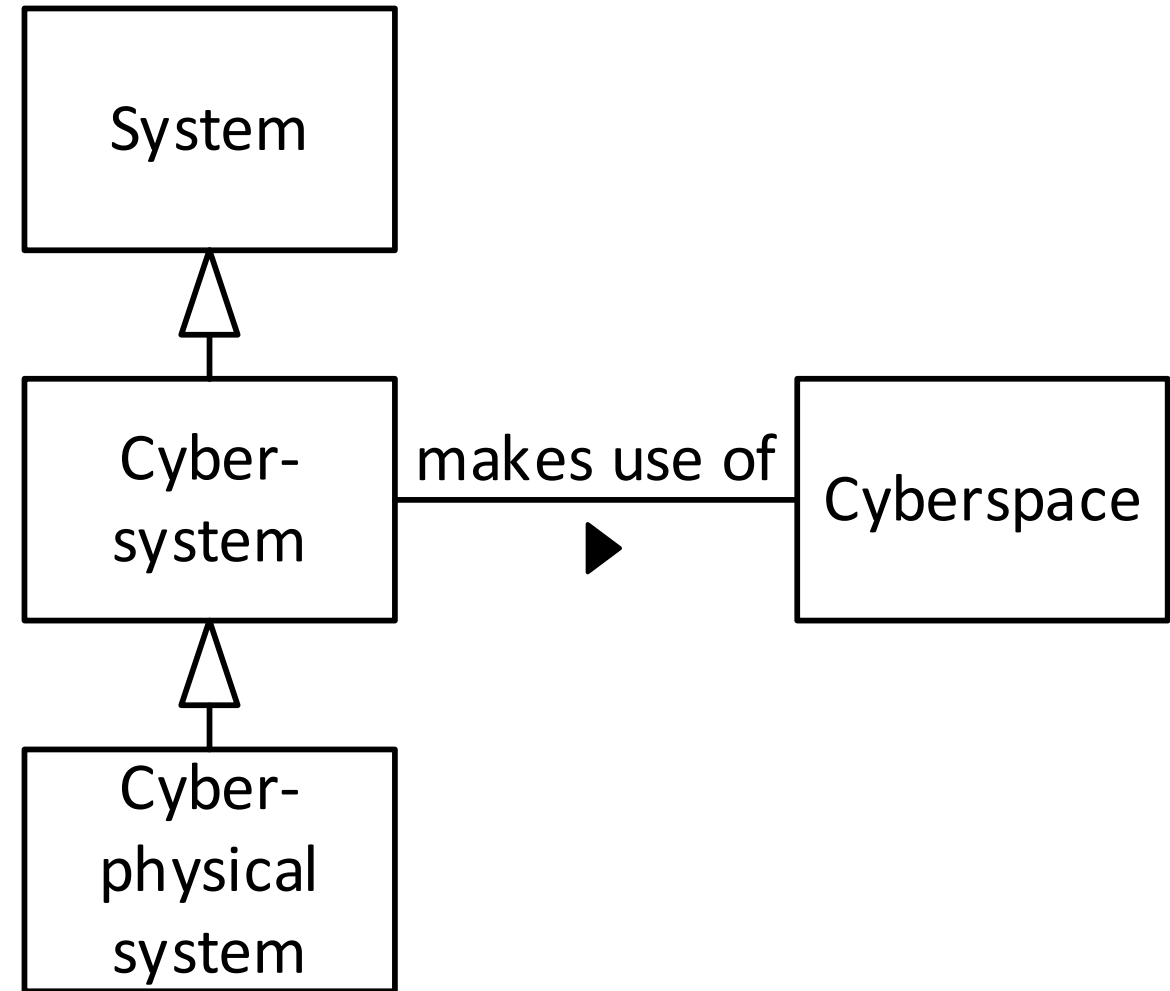
Cyberspace

A cyberspace is a collection of interconnected computerized networks, including services, computer systems, embedded processors, and controllers, as well as information in storage or transit

Cybersystem

A *cyber-system* is a system that makes use of a cyberspace

- A *cyber-physical system* is a cyber-system that controls and responds to physical entities through actuators and sensors



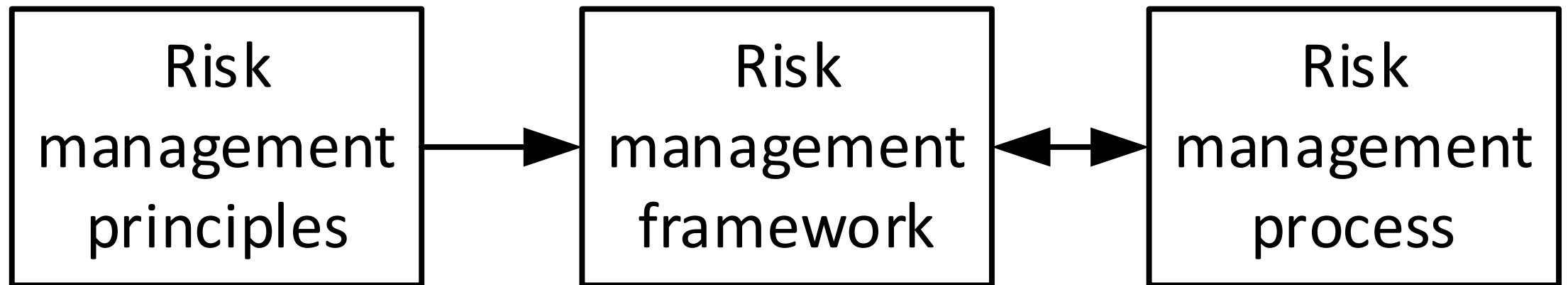
Cyberrisk

A cyber-risk is a risk that is caused by a cyber-threat

- *A cyber-threat* is a threat that exploits a cyberspace

Cyber risk management

Cyber risk management is coordinated activities to direct and control an organization with regard to **cyber risk**



Cyber risk management

- Communication and consultation aims to provide, share, or obtain information and to interact with stakeholders regarding risk
- Risk assessment aims to understand and document the risk picture for specific parts or aspects of a system or an organization
- Monitoring and review aims at determining the current status and effectiveness of ongoing risk management



Cybersecurity

Cybersecurity is the protection of cybersystems against cyberthreats

Relationship to information security

Information security is the preservation of confidentiality, integrity, and availability of information

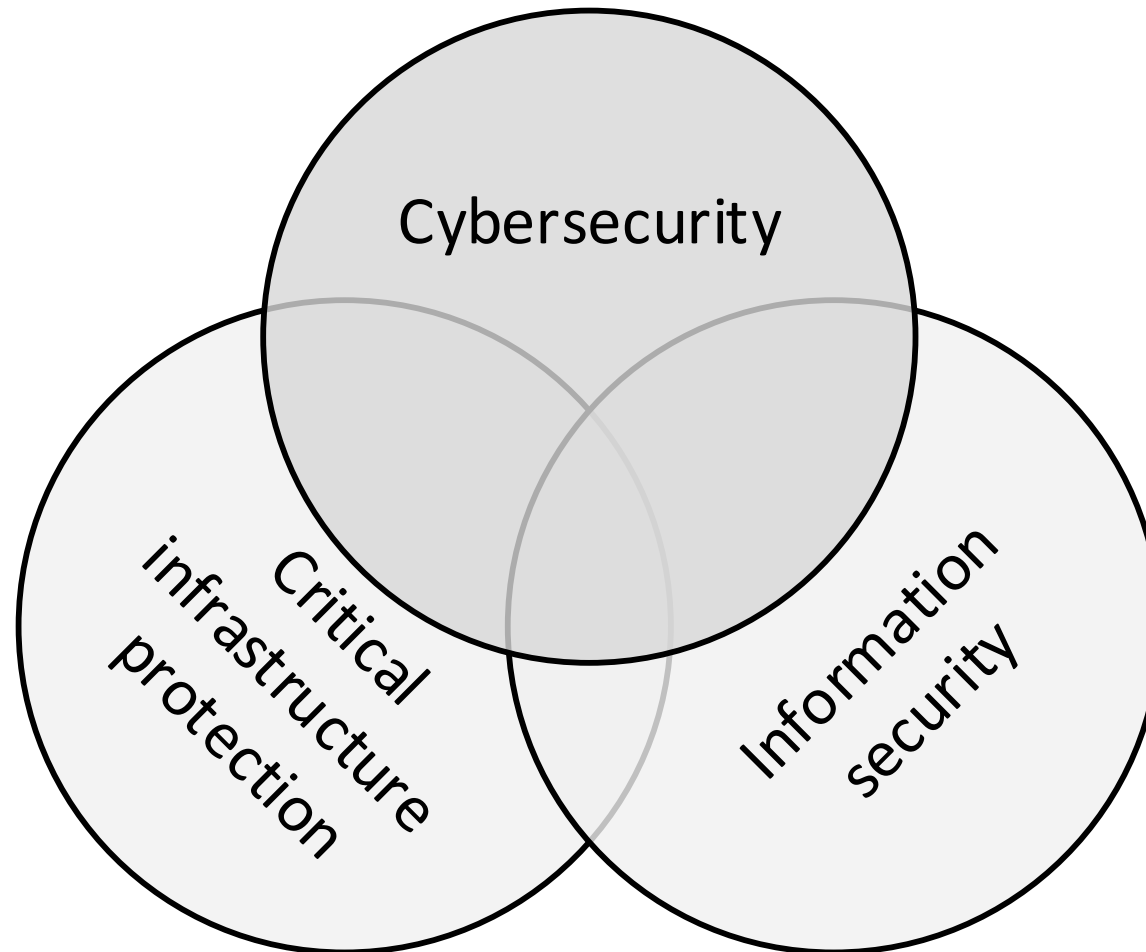
- Cybersecurity goes beyond information security
 - not limited to the protection of information assets and the preservation of confidentiality, integrity, and availability of information
- Information security goes beyond cybersecurity
 - not limited only to threats that arise via a cyberspace

Relationship to critical infrastructure protection

Critical infrastructure protection (CIP) and is concerned with the prevention of the disruption, disabling, destruction, or malicious control of infrastructure

- CIP in general goes beyond cybersecurity since CIP involves the protection and the security of any critical infrastructures, whether or not they make use of a cyberspace.
- Cybersecurity concerns the protection of infrastructures that can be targeted via a cyberspace.

Cybersecurity vs. information security and critical infrastructure protection summarised



Relationship to safety

Safety can be defined as the protection of life and health by the prevention of physical injury caused by damage to property or to the environment

- While safety focuses on system incidents that can harm the surroundings, cybersecurity focuses on threats that cause harm via a cyberspace.
- Safety assets are usually limited to human life and health, as well as environmental assets, while the assets of concern with respect to cybersecurity can be anything that needs to be protected

Relationship to safety (cont.)

The distinction between safety and cybersecurity does not mean that safety issues are outside the scope of the latter

- Safety incidents may have security impact in the same way that security incidents may have safety impact
 - a cyber-attack on a power distribution control system that leads to a blackout could have fatal safety consequences for hospital patients
 - a safety incident, such as a gas explosion, could damage information systems and disable security controls, thereby leaving a system vulnerable to cyber-threats.



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