

 Overview and Instructions Assessment Task 1: Knowledge Questions

Section Overview

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12. Outline the process of developing risk ma... 

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List two types of ICT networks. Include a description of their configuration in your answer.

Virtual Private Network (VPN): It is a virtual network between a VPN Server and a client over internet where data is encrypted. It is composed of a VPN Server and a VPN Client (installed on a client). Usually is used AES-256 as a encryption algorithm and the most popular VPN protocol is OpenVPN.

Storage area network (SAN): It is a high speed network for centralizer storage devices to a reliable and faster connection between clients and storage devices. Usually are composed of a dedicate server, an array of storage devices and SAN switches for manage the connection to the storage array and a management software. This is over a LAN network and commonly uses Fibre Channel for data transfer.

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Complete the following table about network attacks, vulnerabilities and security technologies.

Network attack 1	Network attack 2
<p>List two types of network attack. Briefly describe the type of attack.</p> <p>Outline the vulnerabilities of the ICT system that may have led to each of the attacks.</p> <p>List a security technology that can prevent such an attack</p>	<p>Man in the middle attack: This network attack is active, the attacker intercepts the communication between two devices where the information can be alter or steal. The most common attack is IP address spoofing impersonating another entity on the network.</p> <p>The common vulnerabilities of the ICT system that MIDM attack can use are interception in the communication and leak of authentication. Other vulnerabilities are related to a security on passwords, physical/wireless connection and the channel, for example no-encrypted data.</p> <p>To mitigate the risk can be used</p> <p>1. Network encryption such as TLS/SSL. 2. encrypting the entire communication with a VPN. 3. Also can help increasing the authentication security with Multi-factor Authentication.</p>
	<p>To mitigate the risk could 1. Parameterized correctly for example Least Privilege, input validation and stored procedures. 2. In a application level can be used Data Objects. 3. Web Application Firewalls</p>

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With the expansion of cloud services and new technologies, the use of mobile devices and the Internet of Things (IoT), there have also emerged a number of security issues. List two examples of emerging security issues.

The quantum power to crack passwords: This is my favorite subject to study, the quantum computer currently can perform a variety of math challenges in seconds, this technology is still under development to be used for another purposes. An example of this is, google's quantum computer composed of 105 qubits solved a problem in 5 minutes that it would take 10 septillion of years to solved for a current super computer. Therefore it will be able to crack any password in some years.

Data Breaches: Majority of IoT and mobile devices by default have serious risk of security where personal data is exposed.

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Outline the terms auditing and penetration testing that can be used to measure a network's security.

Auditing and Penetration testing are two ways for measuring a network security.

- Auditing: It is the process of reporting and evaluating all security policies, procedures, configurations and practices in a system to ensure compliance with international standards and laws such as GDPR, HIPAA, NIS2, ISO2700, PCI-DSS and OWASP ASVS. It helps to identify security risks, data breaches and other cyber threats.

- Penetration testing: Also called ethical hacking, is an authorized hacking attempt at penetration on a network or system to identify vulnerable that can be exploited for reveal and report security weaknesses and the type of risk to which the system are exposed.

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Outline two logging analysis techniques that can be used to measure the security of a network.

Normalization: Data attributes are converted to ensure all information have the same format and are consistent. An example of data attributes are IP and timestamp

Classification and tagging: It is a process of tagging events with keywords to classify by group so that related events can be reviewed together.

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Outline two types of security measures that can be put in place in a network.

Whitelisting: Its purpose is indexing approved software that are permitted to be/to run on a system. Their security policies work similar to a firewall, limiting application communication on the network.

Sandboxing: It is about manipulating programs or files in a safe isolated environment. Usually is used a test host with the same characteristics as the deployed host for analyze and find malicious behavior on the network.

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List a type of software that can be used for network security and summarise its capabilities.

Access control software is an Access Control, Change control and whitelisting software that helps an organization to maintain control who/what can access, also monitoring where, when and who perform actions in a network.

Some key capabilities are:

- Monitoring access on the file system
- Managing network capabilities
- Managing/assign users and groups policy controls
- Trigger actions such as block and report when a suspicious action occurs
- Logging and Auditing

An example of this, is Solidcore and could be enhanced with a epolicy orchestrator.

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List a type of hardware that can be used for network security and summarise its capabilities.

A Network Load Balancer receive and process incoming traffic to prevent attack. Often used as a layer of protection against DDoS attacks.

Some keys capabilities are:

- Processing traffic by rules
- Increase performance online traffic
- Driving load balancing

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Given the importance of network security, describe the key features that a network security policy should include, as well as procedures that should be included.

Key features:

- Purpose: Defines a set of rules and guidelines that determine who has access to network resources based on the objectives to be met to protect from potential threats.

- Scope: Covers

- 1) Guidelines on the use of new devices and technologies.
- 2) Rules to be followed when accessing or making changes to the network.
- 3) Procedures to follow when a security breach occurs.
- 4) Procedures for applying access controls to network devices.
- 5) Defining user privileges

- Definitions: Defines what is to be protected on the network and how network users should behave. Provides a framework for extending/enhancing the network. Describes responsibilities for how sensitive information should be protected. Policies also describe how it should be monitored.

- Legislative context: Legal guidelines, laws, regulations and all international regulations that must be met must be followed according to the needs of the organization.

- Policy statement: The policy must specify its objective, to which network objects it applies, as well as the security rules that must be applied and a scheme for their implementation and supervision.

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Outline two network management and security process controls that can be put in place to ensure network security.

Network Access Control (NAC): It is the set of policies that restricts network access to devices, and defines the process of how access should be allowed.

Network Monitoring and Logging: It is the set of policies that defines the process of generating, collecting and analyzing logs for each of the devices on the network.

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Explain the importance of a risk management plan and procedures in network security implementation.

It is important because it is the course of action to take in the face of a possible threat in order to minimize the risks to network security. It also defines process for identifying, analyzing, evaluating, and appropriate countermeasures for each threat. Proper design can reduce the costing when changes arise in network security implementation procedures.

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Outline the process of developing risk management plans and procedures as part of network security planning.

To develop risk management plans and procedures as part of network planning, the following must be taken into account:

- Risk assessment
- Mitigation strategies
- Response plan procedures
- Each stage of the process must be regulated and monitored

The steps for its development are:

1. Perform a Assets requiring protection
2. Categorising assets and calculating their value
3. Simulating a Attacker scenarios and threats
4. Design Security measures for network components
5. Establish network and access security controls
6. Developing security policies
7. Documenting
8. Apply Auditing and incident response procedures

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Explain how risk management should be built into cost analysis and budgeting of network security. Give an example to illustrate your answer.

The costs derived from a risk management plan implementation project depend on the costs assigned to the project and must take into account the potential risks of the project cost, so an organization must find a balance since there are no unlimited resources. An example of this is, A small company uses a piece of hardware such as a Network Load Balancer as part of its strategy to respond to DDOS attacks. However, the company is growing rapidly and cyber attacks are also increasing, consuming many resources from the company's internal network. So, it wants to implement a better system to reduce costs. It is determined that scaling the current system has very high operating and maintenance costs, so now another solution must be found, which may be more expensive, in addition to starting over with a network security design.

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